The Magazine For Hewlett-Packard Enterprise Computing

HP Professional

JANUARY 1997

HP-UX

◆

Windows NT

◆

MPE/iX

A Cardinal Publication

WINDOWS NT-TO-UNIX INTEGRATION

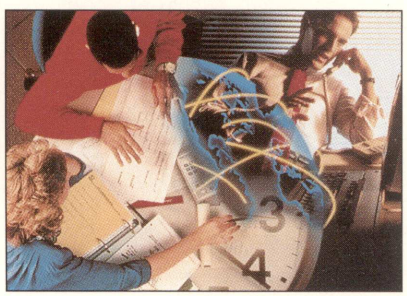
A Kludge Beyond Relief

Windows NT integration poses a challenge to managers of multivendor enterprise internetworks. Fortunately, an array of third-party technology is available to help bridge the gap. Discover 55 of them inside. **PAGE 28**

Push Me, Pull You

Who will be left hanging when it comes to HP's Windows NT-to-UNIX strategy? If the suspense has been killing you, read Tom Kucharvy's expansive analysis of the issues. **PAGE 39**

Industry Watch PAGE 12



INsite Case Studies

Motorola Engine Design

HP's WorkManager links the AIEG's electrical and mechanical data.

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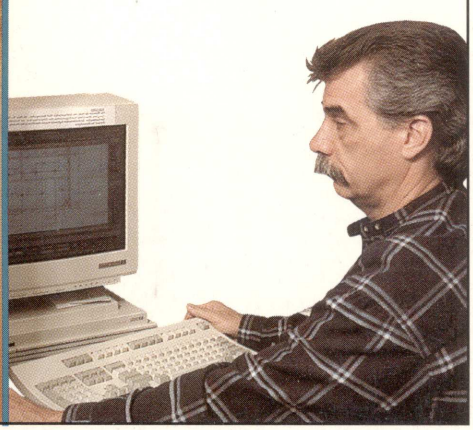

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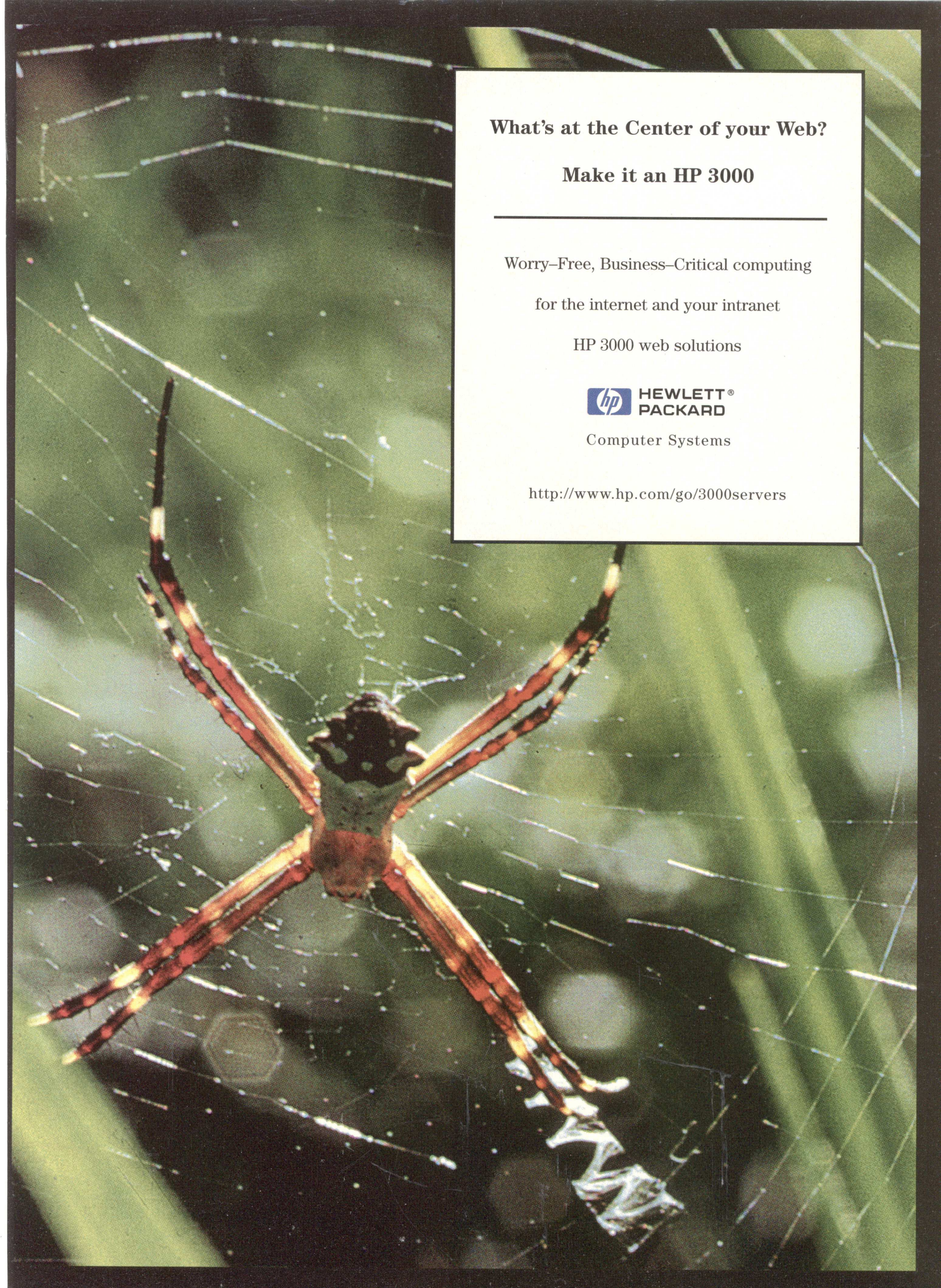
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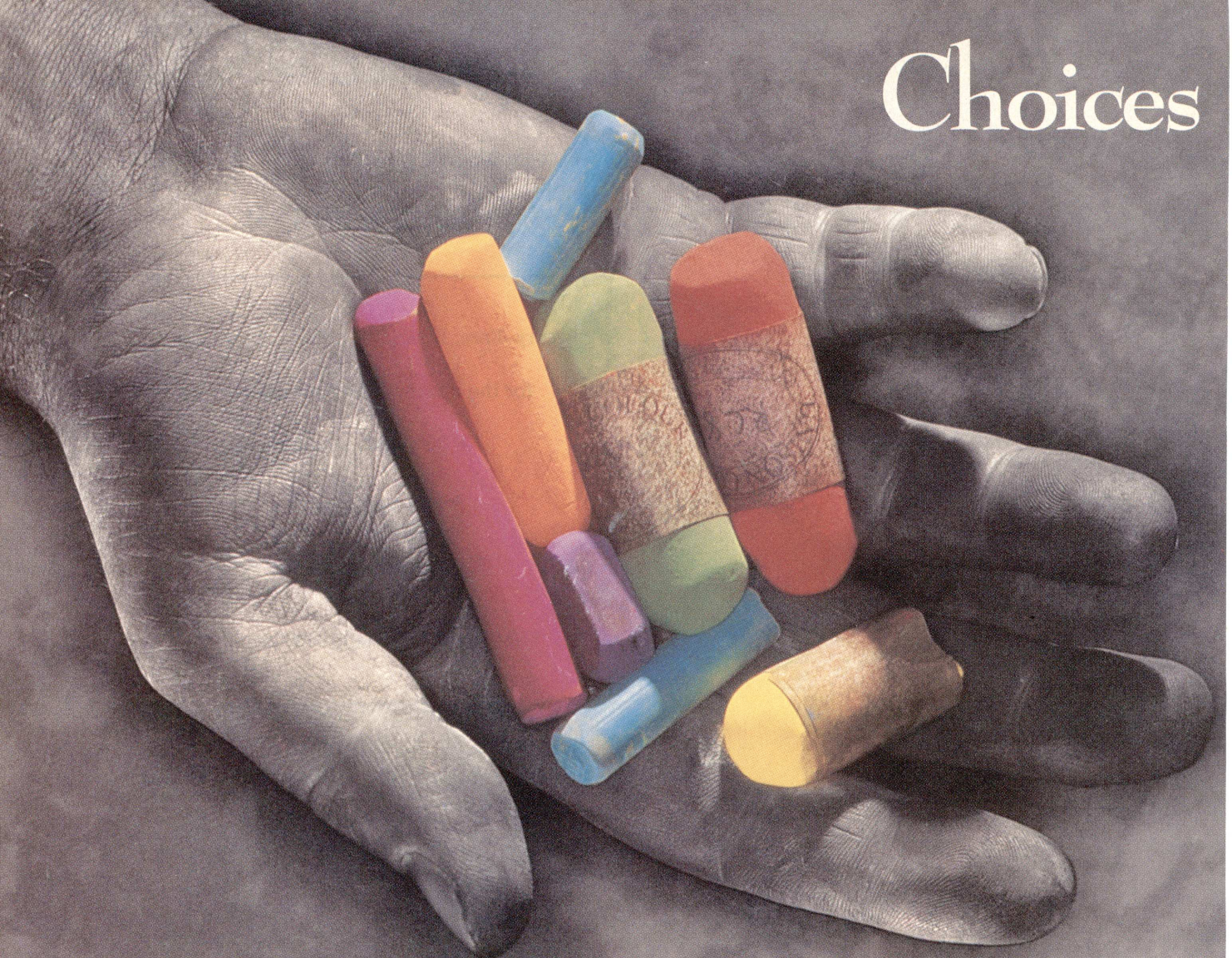

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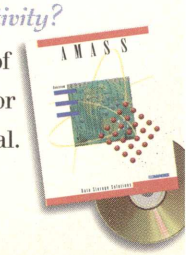

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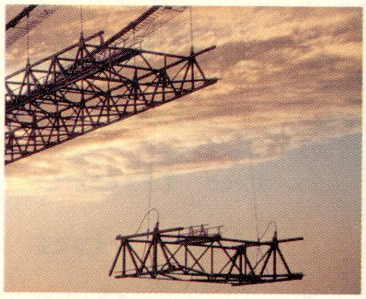

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HP PROFESSIONAL ISSN 0896-145X is published monthly by Cardinal Business Media Inc., 1300 Virginia Dr. Ste. 400, Fort Washington, PA 19034. Subscriptions are complimentary for qualified U.S. and Canadian sites. For reprints, contact Reprint Management Services, 505 E. Airport Rd., Lancaster, PA 17601; (717) 560-2001, FAX (717) 560-2063. Periodicals postage paid at Fort Washington, PA 19034, and additional mailing offices. **US** POSTMASTER: Send all correspondence and address changes to HP PROFESSIONAL, P.O. Box 3053, Northbrook, IL 60065.

CANADIAN POSTMASER: Send all correspondence and address changes to Cardinal Business Media, C/O N.I., P.O. Box 44, RPO Rockwood Mall, Mississuaga, ON L42 9Z9.

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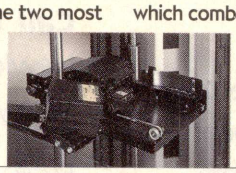

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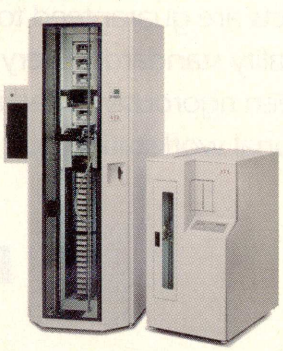

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UNIX And NT

It Could Be A Very Good Year

This past year has to be one of the most interesting in the computer industry. Talk of the Internet dominated everything; that is, until it was replaced with talk of the intranet, which seems more likely to come to fruition in 1997.

However, Windows NT remains just as important in network environments built around HP host computers. As a result, the need for products that are able to seamlessly integrate these workstations with HP host computers is also increasing considerably. A primary component of this integration is the TCP/IP protocol.

In HP-UX environments, TCP/IP is sufficient for integrating NT. The Microsoft TCP/IP protocol stack that ships with NT may be enough for reliable, functional connections to HP 9000s. But HP 3000 environments often require additional support than what is provided in Microsoft's basic TCP/IP stack. In addition to NS/VT, IS managers may need TCP/IP encapsulation over IEEE 802.2 and SNAP, support for HP's unique use of the PSH bit, HP ARPA Sockets support, Probe protocol support or HP resource sharing support through NetBIOS. These components allow IS managers to continue using legacy HP 3000 systems and applications without costly modifications, while fully integrating with UNIX and NT servers.

Patricia Ryan
General Manager European Operations, WRQ

Beyond the TCP/IP stack and NS/VT, there are other important components for integrating NT into HP environments. An obvious link between an NT workstation and HP hosts is terminal emulation. Many HP environments already contain a mixture of UNIX and Novell file servers in addition to HP 3000 hosts. NT workstations can easily access files on Novell servers, but what about access to files on a UNIX server?

NFS is the technology that provides integrated access to UNIX files from a PC. New versions of NFS that support Windows NT 4.0 allow UNIX servers to be accessed the same as any other network drive from within the Internet Explorer interface. With NFS, terminal emulation, a full-featured TCP/IP stack and NS/VT, NT workstations can be provided with full access to all the components on the network.

One of the more pronounced trends in the desktop-to-host connectivity business is the rise of PC X servers. An operating system like NT, because of its power, security and true multitasking, makes running X Window System applications on the desktop not only reasonable but preferable to cluttering up the workspace with an extra piece of hardware like an X terminal. PC X servers running on NT draw just as fast and conform to the X protocol just as completely as X terminals. The trend to buy a piece of software — a PC X server — instead of a piece of dedicated hardware — an X terminal — will continue to accelerate.

The increasing demand for access to the Internet and to corporate intranets is having an impact on HP environments. Vendors who have traditionally provided connectivity solutions to HP hosts are leading the way in incorporating Internet/intranet access into their products. Currently, the state-of-the-art solution is to supply suites that provide the underlying networking protocols and the TCP-related applications necessary to get to information on the Internet/intranet.

There also is a desire on the part of HP systems administrators to simplify things on the client side, and perhaps to move to the Web browser as the universal interface, no matter where it is located. Some vendors are already providing ways to launch HP host sessions from the Web browser. There is much work underway to incorporate ActiveX and Java into host access solutions, thereby making access to intranets much easier.

Change has always been the rule rather than the exception for HP systems administrators, but the stepped up pace of change, which is in some circles being referred to as "Internet time," is new. The trends that we're seeing now hold out a great deal of hope, promising universal access to information. It should be an interesting year.

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LETTERS

JARGON JIMJAMS

Although a certain amount of jargon is necessary in any technical discipline, I think that it behooves us in the computer industry to avoid unnecessary and unexplained terminology. I decry the appearance of the following terms in your publication, none of them explained: B-class, C-class, D-class, K-class, S-class, X-class and NUMA.

Possibly there are others; these are just the ones I noticed reading as far as page 12 of the October 1996 issue.

Some magazines provide a glossary of unusual terms used in the magazine; I commend the idea to your attention. In the meantime, I hope that you will enlighten me by some means so that I will know what you are talking about.

Robert A. Saunders
Riyadh, Saudi Arabia

First, we'll take responsibility for NUMA, a relatively new term, which is the acronym for Non-Uniform Memory Architecture. Using a NUMA architecture, servers can scale to hundreds of processors while preserving the traditional shared memory programming model. Consequently, existing UNIX apps developed for symmetric multiprocessing (SMP) systems do not have to be rewritten to run on NUMA systems.

Second, HP no longer uses the Series 800 and Series 700 when naming or referring to its new products. It's been using the alphabet letter designations to which you refer for the last two years for its UNIX servers. And we clearly explained the name change for HP workstations in our June 1995 Industry Watch. As an independent magazine, we assume no culpability for HP's marketing tactics.

Although your point about a glossary is well-taken, every publication has to make general assumptions about its readers' technical literacy. And the majority of our readers seem happy with our decision to use the space in HP Professional *for as many technical columns, features and case studies as possible. Finally, we encourage all our readers with reasonable comments and opinions to send them to us for publication on our letters page. Thanks for your enthusiasm.*

—The Editors

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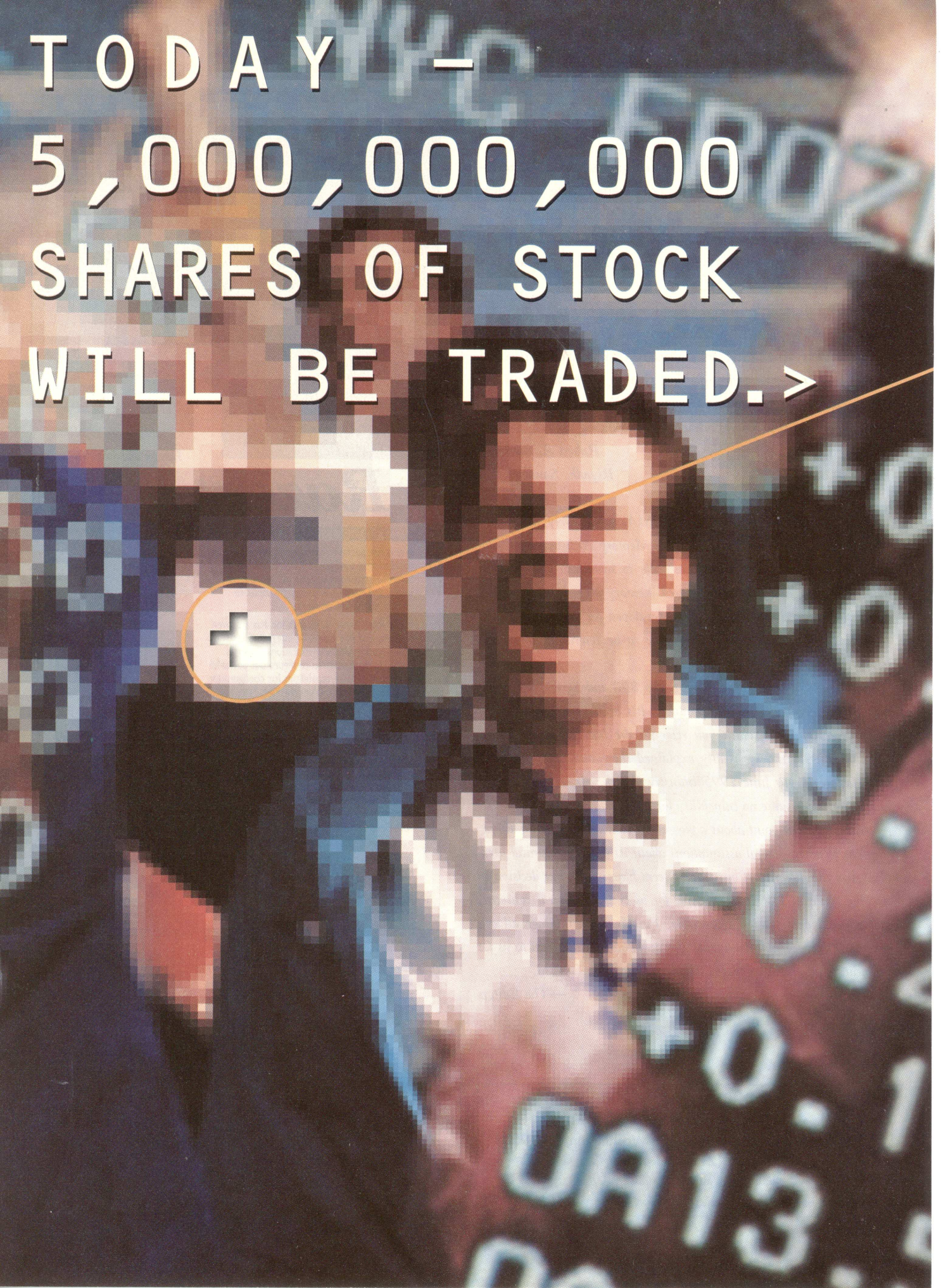
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CIRCLE 159 ON READER CARD

Research • Reports • Reviews

INDUSTRY WATCH

By George A. Thompson

ROCKY MOUNTAIN HIGHWAY FOR HP WORKSTATION PERSONNEL

In a surprising announcement made this past November, HP decided to move the marketing and management functions of its Workstation Systems Division (currently located in Chelmsford, Mass.) to Fort Collins, Colo. The Fort Collins site is already the home of HP's graphics software and hardware developers, and the host site for the research, development and marketing of graphics technologies as well as the workstation sales center.

Most importantly, the Fort Collins site houses the product and program marketing for HP's Mechanical Design Automation (MDA), Electronic Design Automation (EDA), Architecture, Engineering and Construction (AEC) and Mechanical Computer-Aided Design (MCAD) teams which are critical segments in HP's technical-computing strategy. Announced last June, high-end technical computing, where 3D graphics and modeling are the norm, is now the primary market for workstations. According to HP, the company "is working toward a PC-like cost structure for manufacturing PA-RISC workstations."

All 100 employees now in Chelmsford who hold marketing and management functions will be offered positions and relocation benefits to move to Fort Collins. Also, 100 employees in support service will be offered job placement assistance. Workstation Systems Division employees in Chelmsford will be offered positions in Fort Collins or may apply for positions in other parts of the company. Employees not interested in relocating to Colorado may devote four months to search for another job within HP. The Chelmsford site will remain as the headquarters for HP's Internet Technology Group (ITG), created in August when Ira P. Goldstein returned to HP, as the chief Internet technology officer (see Industry Watch, September 1996).

IN DEPTH

IN SHORT — PCs ON PAR WITH WORKSTATIONS?

It's no surprise that HP is moving toward a PC-like cost structure for manufacturing its PA-RISC-based workstations and a more flexible infrastructure for manufacturing. But perhaps more importantly, HP is also getting itself ready to fend off serious challenges from Compaq Computer (Houston, Texas), which announced its official entry into the workstation market this past August. HP has already gotten a taste of Compaq's low-cost approach in the server market, where Compaq's Wintel ProLiant servers compete effectively with HP 9000 (PA-RISC/HP-UX) servers in performance. But there's no comparison on price. A Compaq ProLiant 4500 5/16 Model K410 (at the time they were introduced) cost more than 50 percent less than the comparable HP 9000.

Now a widely recognized worldwide supplier of commercial Wintel desktops and servers, Compaq introduced the Professional Workstation series of Intel Pentium Pro/NT-based PCs in October. And Compaq is boldly targeting three significant, high profile markets, which have traditionally been the sole province of RISC workstation suppliers, HP in particular: mechanical computer aided design, interactive content and software development, and financial information and analysis.

Faced with a rising demand for NT-related products and services from corporate IT, demand for UNIX workstations are declining. Among its computer products, HP 9000 workstations had the weakest order growth in fiscal 1996. With the introduction, by HP PC's division, of its own Intel/NT-based Vectra PCs (a.k.a. personal workstations) late last year and the Chelmsford re-shuffling, HP is moving its desktop product manufacturing toward the market sweet spot — low cost, high volume NT systems.

— George A. Thompson, Senior Editor
thompsonga@cardinal.com

DEJA VU FOR EXETER PLANT

In a related workstation market development, HP announced that it is searching for an outsourcing partner for the printed-circuit assembly manufacturing at its Fort Collins site and for workstation manufacturing now located at its Exeter, N.H. plant. Pending HP's success in finding an outsourcing partner, the Exeter plant is slated to close.

It's deja vu all over again for the Exeter employees, 45 miles from the Chelmsford, Mass. site where workstation marketing and sales employees are preparing to move to Fort Collins. Manufacturing workers at the Exeter plant got a pardon two years ago after a similar HP decision to close the plant. At that time, however, Exeter had just won an internal HP award for efficiency and HP CEO Lew Platt gave the plant a reprieve. If the manufacturing at the sites is outsourced, all affected employees will be offered other positions within HP or with a third-party manufacturer.

BLUE CROSS MANAGES WITH CARE AND WITH HP

Blue Cross of California recently selected HP to provide an array of products and consulting support to improve the service to its 1.4 million customers.

Besides a number of HP 9000 servers and NetServer systems, Blue Cross has selected two HP software products — Customer Contact

Manager (middleware) and MC Service Guard (high-availability) as well as consulting and integration services from HP's PSO.

SmartContact will help Blue Cross integrate its voice and database systems, thereby putting claims, benefits and eligibility information immediately in front of customer service reps (who are now using 3270 terminals) as they answer a telephone call. According to Blue Cross numbers, its 1,600 customer service representatives handle some 800,000 inquiries per month from health-care providers. And the number of calls are increasing more than 15 percent a year.

TWENTY MILLION MERCHANTS CAN'T ALL BE WRONG

At least that's what HP and VeriFone, Inc. (Redwood City, Calif.) are counting on. Fleshing out the details this past December of a strategic alliance first announced in May 1996, HP and VeriFone are jointly participating in the worldwide Secure Electronic Transaction (SET) trials sponsored by VISA and MasterCard.

VERBETA

"It's a harder fight than it was."

— Richard C. Watts, general manager of HP's Computer Division, referring to competing with IBM — *Business Week* (December 9, 1996)

The trials will include the implementation of full end-to-end SET-compliant software and transaction processes for consumers, merchants and financial institutions.

According to an HP spokesperson, 37 banks across the United States have shown interest in conducting SET trials, which are expected to start slowly at the beginning of this year and evolve throughout 1997. HP and VeriFone plan to bundle SET trial solutions for acquirers and merchants, including VeriFone's vGATE, vPOS and vWALLET software using a VISA and MasterCard-approved SET. SET, first published by VISA and MasterCard in February of 1996 provides a protocol for transaction authorization, authentication and capture. The protocol is designed to be easily integrated into the existing global financial backbone rather than layering a new set of protocols and applications over existing transaction services already in use by some 20 million retailers.

The two companies plans also include marketing VeriFone's vPOS software (which directly connects the merchant with financial institutions or payment processor) with HP's NetServer platform and Microsoft's Merchant Server to offer a turnkey solution for merchants extending their business to the Internet. VeriFone's vGate software (a gateway to the Internet for financial institutions and payment processors) will be bundled with HP 9000 servers and integrated with HP's Praesidium VirtualVault, its Internet-security solution.

For additional analysis on the SET and the HP/VeriFone agreement, see the Internet Digest column on page 46.

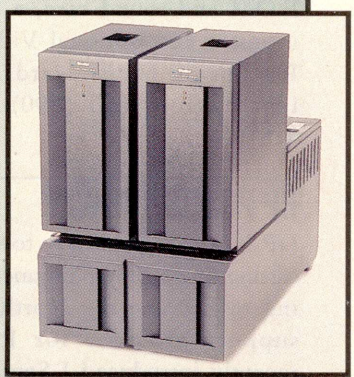
STRATUS AND HP ARE TOLERANT TO A FAULT

In December, Stratus Computer Inc. (Marlboro, Mass.), well-known for its fault-tolerant systems, announced the Continuum Enterprise Server ($70,000 to $250,000), which combines their Continuum Series hardware (starting with the entry-level Series 400, with the addition of the Series 600 and 1200 in 1997) with HP-UX 10.10 to provide a continuously-available hardware/software system. The Continuum Series is currently based on HP's PA-RISC 7100 processor. But according to John Scanlon, vice president of marketing, telecommunications, Stratus plans to update to the PA-8000 chip by midyear 1997 and then follow HP's 8xxx CPU roadmap thereafter. "This includes any future products that result from the HP/Intel partnership," Scanlon says, "such as the recently introduced Merced chip."

Likewise, Stratus plans to update the OS, with HP-UX 10.2 planned for the end of 1997. "We'll track HP with each of their revisions, with about a six month lag time," says Scanlon. "We'll be slightly behind them for two reasons. First, because it will simply take more work on our part [to get the OS implemented]. And second, because a lot of users are reluctant to upgrade to a new version right away. They would rather wait until some debugging has been done."

Scanlon says this offering is simply another option, and not a replacement for their current SVR4-based FTX (Fault-Tolerant UNIX). "About 40 percent of our business is in telecommunications and they are using FTX, and most likely they'll stay there for the foreseeable future" he says. "However, as a 3DA-based OS comes to be in the 1998/1999 time frame, they may take another serious look."

There are two main customer benefits from this project. First, because the Stratus HP-UX is completely ABI-compatible with HP's HP-UX, the continuous availability is completely transparent. Second, users now have access to a continuous availability environment without having to introduce another operating system.



Scanlon sees the Continuum Enterprise server as filling a niche that didn't exist before. "As we become more and more wired in our personal and company-to-company lives, applications that were not considered critical have evolved into continuous availability issues." And while the Continuum Enterprise Server will compete with HP's high-availability solutions in some areas, Scanlon believes that both companies will be getting business from IBM and Sun customers and therefore "the overall pie will simply get bigger."

— Deborah Schwartz, Associate Editor
schwartzdr@cardinal.com

JOHN CLEESE CALLING AND THAT'S NO JOKE

Who can forget the hijinks of Britain's (in)famous Monty Python comedy troupe. Although the hilarious TV sketch routines of Monty Python are but a fond rerun memory, their spirit lives on through John Cleese and Video Arts (Chicago, Ill.), the company he co-founded in 1972.

With a CD-ROM entitled *Phone Fundatmentals*, the Monty Python alumnus is putting his sense of humor to work in the computer age.

Billed as "a fast, fun and memorable multimedia learning experience on fundamental business telephone skills," that "promise to transform computer-based management training" much like what Video Arts laugh-and-learn business videos (Cleese's first attempt at bringing humor to the corporate workplace) did in the past. The CD-ROM program, aimed at entry-level employees, combines full-screen, full-motion (.AVI) video and feature Cleese and other performers in "wrong way" phone conversations.

The CD will run on a system with a minimum of a 66MHz 486DX CPU with 8MB of RAM, 10MB hard disk space, Windows-compatible CD-ROM and sound card, a SuperVGA monitor and optional Videologic or Realmagic MPEG card. For more information, call (800) 553-0091 x1513.

HP POINTS THE WAY

HP is pointing the way toward broadcasting on corporate intranets by agreeing to become the North American support provider for PointCast's recently introduced I-Server product, which provides a company with a "channel" to broadcast corporate information and news via an internal PointCast network. Important company news, such as new product releases, competitive updates, earnings releases, company policies and other information can be broadcast over the private, internal channel. The agreement also enables HP to offer I-Server installation services to PointCast customers.

PointCast pioneered "Web broadcasting" by delivering general news, industry, lifestyle and other information directly to users' desktops (for free). The PointCast I-Server extends that network concept by adding an internal "company channel." According to Zona Research (Redwood City, Calif.), the I-Server also acts as a local cache of the public PointCast network, thereby reducing the enormous flow of traffic across a company's firewall. The updated information can then be accessed by individuals without going through the firewall. [But that's not all Zona had to say. Check out our Research Roundup.]

Under the agreement, PointCast will maintain primary customer contact with corporate customers to ensure that the PointCast I-Server technology and HP support are well integrated. As part of the agreement, the following services will be available: first- and second-level support services provided by HP and sold by PointCast and its resellers; optional round-the-clock support; on-site installation of PointCast I-Server software; training courses; related Windows NT support provided by certified HP engineers; and overflow support coverage for PointCast as needed.

The PointCast I-server is available for $995 per server CPU.

RESEARCH ROUNDUP

GETTING TO THE POINT WITH POINTCAST

"Because of PointCast's high demands on network bandwidth and desktop system resources, we have often viewed the PointCast Network as more burden than benefit. In a survey of IT managers, we found that 75 percent of those who had a policy of regarding PointCast either discouraged or prohibited its use. Unless the company can significantly reduce the burden their product puts on network and system resources, users' infatuation with PointCast may simply be something to grow out of."

— Zona Research (Redwood City, Calif.)
— October 1996

TO WHAT DO MY WATERY EYES SHOULD APPEAR?

If it's a miniature sleigh and eight tiny reindeer, it's not your eyes that are the problem. Or maybe you're just not seeing that well these days. The eyes have had it, according to the preliminary results of a survey conducted by Erik Nilsen of Lewis and Clark College (Portand, Ore.). and Dr. Cosmo Salibello of Prio Corp. (Lake Oswego, Ore.). And it doesn't look good (no pun intended). The number of computer users seeking professional help with eye strain, exhaustion headaches, blurry vision, tired or burning eyes and other symptoms of computer vision syndrome have increased by five million patients — that's an increase of 50 percent since 1992, say the two researchers.

According to The Human Factors Society, ambient lighting should be located to minimize glare, which can reduce visual performance. Keep bright light sources out of the peripheral vision while looking at the screen. And keep a minimum of at least a foot between the screen and your face.

THREE OPEN UP TO OPENVIEW

Compaq's Insightful View

Compaq announced the worldwide availability of Insight Manager for HP OpenView, which allows customers to view the status of Compaq servers and desktops throughout the enterprise in real-time from a management console running HP's OpenView Network Node Manager 3.3.

Platinum Technology Is Golden

In December, HP and Platinum Technology Inc. announced a global reseller agreement that will put more than 50 products at the disposal of HP's PSO. With an everything-but-the-kitchen-sink approach, the range of products includes systems management, data warehousing, database utility, business intelligence and application development tools and product suites. Availability is worldwide. Already an HP International Premiere Partner, Platinum expects to expand its distribution channels. Platinum currently provides the largest portfolio of products certified on OpenView.

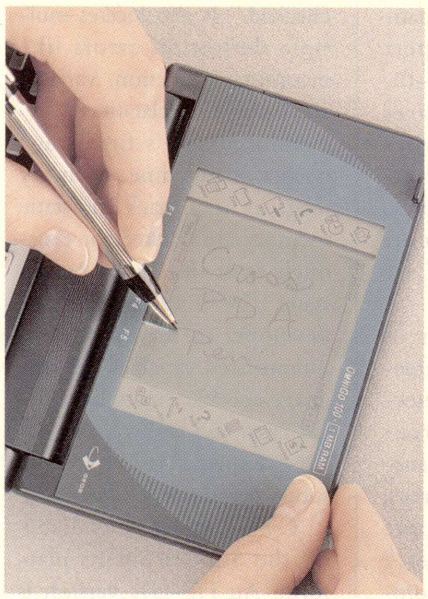
Prolin Becomes A Certified OpenView Partner

In December, HP announced that Prolin (Amsterdam, Netherlands) became an OpenView Premier Partner and that Prolin's IT Services Manager, a helpdesk software suite, has passed OpenView Certification Testing. Messages and events can now be automatically forwarded to IT Service Manager for help desk processing. Prolin's suite modules include service level manager, change manager, problem manager, helpdesk manager, configuration/IT asset manager, report manager, and software control and distribution.

CROSSING OVER TO PEN COMPUTING

A.T. Cross (Lincoln, R.I.), of Cross pens fame, announced the formation of a new Pen Computing Group, within their R&D division, "aimed at capturing some of the myriad opportunities being used by the growing use of electronic technology for communication."

And the new group wasted no time



Cross hopes to cash-in on the expected demand for PDAs and other wireless handheld devices, which usually include a stylus for input rather than a mouse or other device.

announcing their first product: the Digital Writer PDA Pen. Don't laugh: HP is currently testing the Digital Writer with its OmniGO PDAs.

The new PDA pen is made with a high composite material pen tip which offers a smoother "pen-to-paper" feel on a slippery, plastic screen. The polymeric stylus is for use in all its ball point pens, electronic or otherwise. Cross will sell the DigitalWriter directly to end users (with prices ranging from $17.75 to $300) with a controlled retail launch set for later this year.

I DID NOT KNOW THAT ...

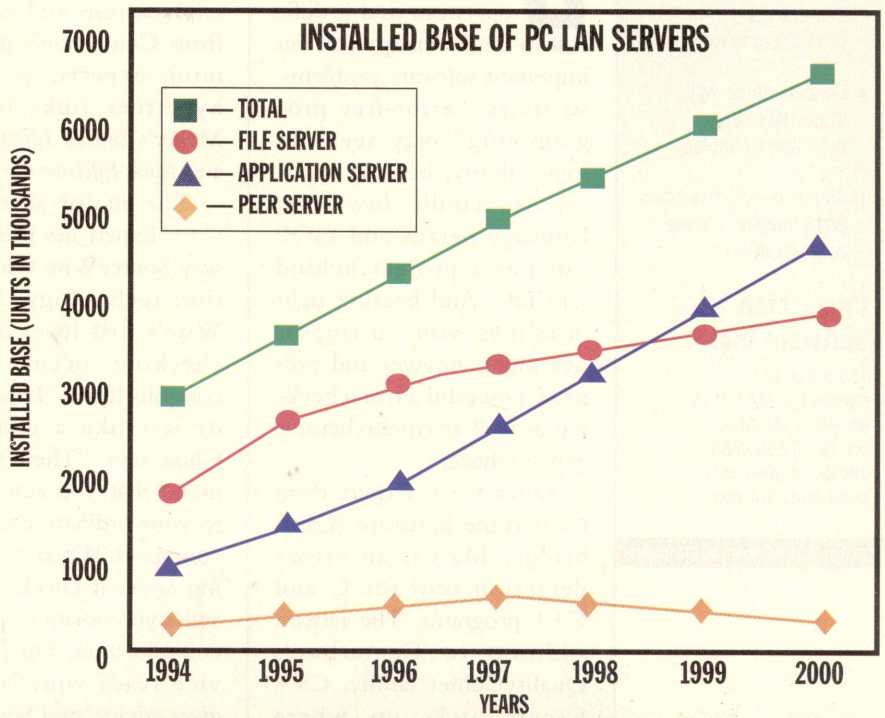
26 percent of the software in use in the U.S. is pirated, totaling $3 billion in domestic piracy losses.

Business Software Alliance (Washington, D.C.)

A DIFFERENT KIND OF CRITICAL

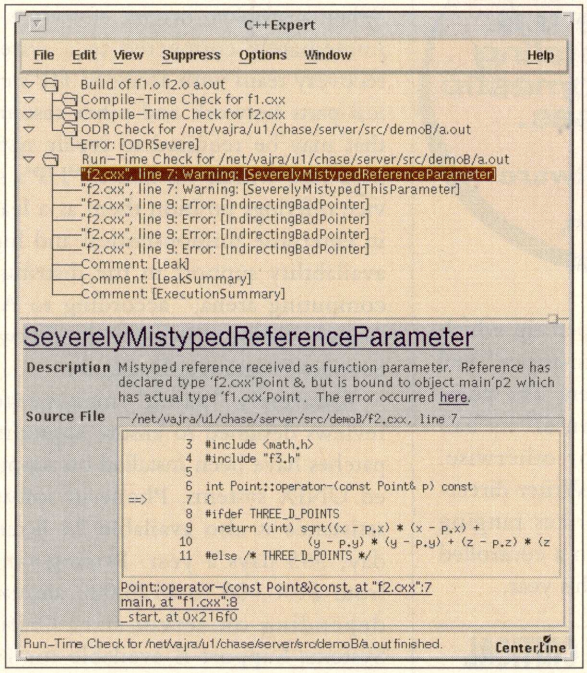
How would you like to resolve all your HP system hardware problems within six hours of making a telephone call. Well, with HP's new Critical Systems Support, it might very well be possible. HP Critical Systems Support is a suite of capabilities designed to ensure minimal productivity loss in enterprise-class distributed computing environments. When a problem occurs, customers are immediately connected to a system-recovery team with access to HP's critical-parts network and other resources that may be required to repair system hardware within six hours. "HP's service offerings position them as a leader in enterprise mission-critical and high-availability support in the distributed computing arena," according to Amy Osetek, senior analyst for the Software Services Program at Dataquest.

Quarterly "patch" management reviews designed to ensure appropriate patches have been installed on supported UNIX systems. Phone-in software assistance is also available 24 hours a day, 365 days a year. Pricing ranges from $100,000 to $120,000 annually, depending on server size. Critical Systems Support is available for HP-UX. The service is expected to be extended to Windows NT in the second half of this year.



According to Strategic Research Corp. (Santa Barbara, Calif.), network servers will grow over 14 percent in 1997 to 1.4 million.

Expert Advice On Error Checking



C++ EXPERT

- On-Line Advice features explanations and examples from Centerline's programming experts
- Contains three-way SourceWise error detection technology
- Single user license costs $995; floating license costs $2,495

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CIRCLE 352 ON READER CARD

Both beginning and expert C/C++ developers can find it difficult to detect many small but important software problems. At times, "error-free programming" may seem an impossibility, because learning to handle low-level language details and OOP can put a project behind schedule. And because tight deadlines won't disappear overnight, novices and pros need powerful error-checking as well as comprehensive expert advice.

Enter C++ Expert from CenterLine Software (Cambridge, Mass.), an error-detection tool for C and C++ programs. The newest addition to Centerline's QualityCenter family, C++ Expert picks up where ObjectCenter, Centerline's object-oriented, error-checking interpreter, left off. "We wanted something that would do as much as we did with ObjectCenter, but was faster and smaller," explains David Chase, a lead developer of C++ Expert.

For many years, programmers, when faced with tough problems, had to start thumbing through a stack of reference manuals thicker than most city phone books. With C++ Expert, the manuals — and the expert knowledge — is built-in. On-Line Advice features explanations and examples from Centerline's programming experts, as well as hypertext links to Scott Meyer's books *Effective C++* and *More Effective C++*.

The major strength of C++ Expert lies in its three-way SourceWise error detection technology. SourceWise's first level of error-checking occurs during compile-time. "It acts more or less like a compiler," Chase says. "There's a command that you run prefixed to your ordinary compilation command. When it's compiling code, it checks for bugs and style violations." During compile time, On-Line Advice reads your code and gives advice, and SourceWise uncovers compile errors like dead code, unused variables and bad parameter types.

The second stage begins at link time. Here, C++ Expert ferrets out the more troublesome, hard-to-find link errors. Chase says, "it checks for different rules — not Meyers' rules, but rarely checked parts of C++ standards. If you get them wrong, your code can behave in a peculiar way. These typically inconsistent definitions aren't usually checked." It also locates multiple definition errors like inconsistent function, variable and structure declarations.

SourceWise's final stage occurs at run time. Memory usage in heap, stack and static memory are tracked for thorough error detection. At this stage, C++Expert alerts the developer to memory leaks, uninitialized variables and language-specific errors like illegal casts and null references. C++ Expert also can identify subtle pointer problems.

C++ Expert is available on the SunOS/Solaris platform. An HP-UX version is scheduled for release sometime in 1997. IBM AIX and Windows NT platforms are under development. A single user license costs $995, with a floating license priced at $2,495.

—David Acord
Contributing Author

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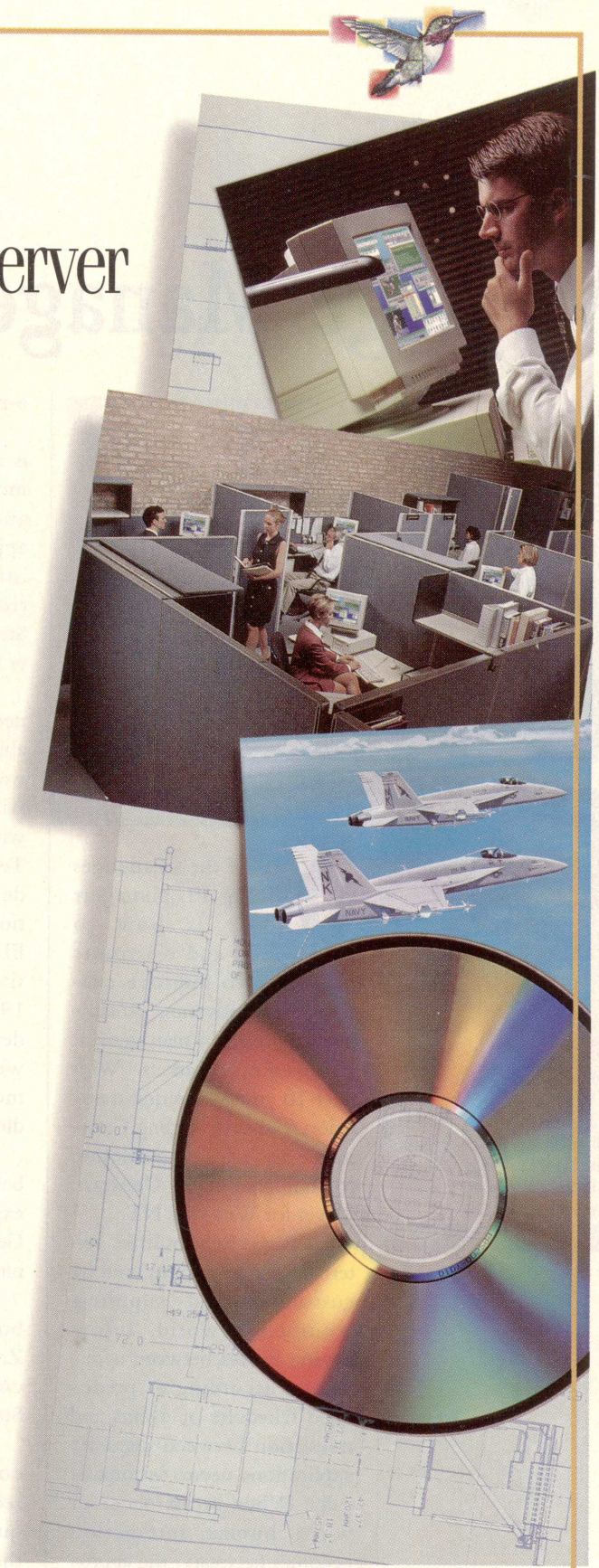

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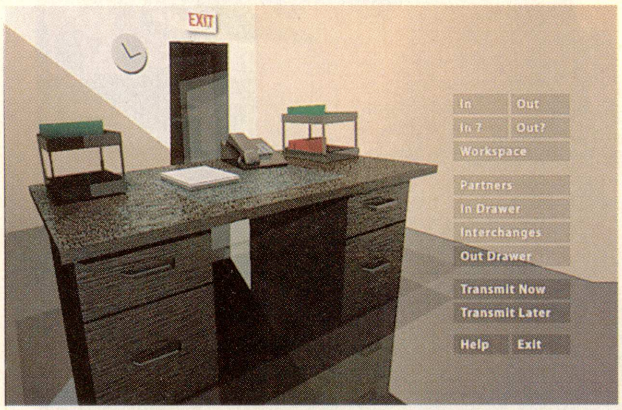
CIRCLE 156 ON READER CARD

Message Management For NT



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CIRCLE 448 ON READER CARD

One of the challenges facing IT managers today is how to deploy EDI and electronic messaging to improve customer responsiveness, streamline supply chain management and open new markets. With over 10 years delivering translation software, Sterling Commerce has released a solution to that challenge: Gentran: Server for Windows NT.

Gentran:Server links internal business systems used by customers and suppliers around the world. Information moves between applications according to predefined schedules or events and translation between disparate applications occurs automatically. When errors occur or when human interaction becomes necessary, the appropriate people are notified via e-mail or beepers.

"What our software does is allow you to take a common format and translate it to and from a format that is appropriate for integrating into your legacy applications," says Tom Crable, Sterling's production manager for Windows NT.

"It has everything I ever needed it to do. I have been able to map things just like I wanted to do," says Robert Allison, EDI coordinator with Input/Output (Stafford, Texas). The company, which deals with seismic acquisitions, decided to implement EDI and became a beta test site for Gentran in March 1996. On average, Allison deals with 300 invoices per week which he says, are more than adequately handled by the software.

Allison points out that before a crash course he had no experience with EDI or with Gentran, but was up and running without complications.

"Our primary market is business-to-business," says Zachary Zettler, director of corporate marketing with Sterling.

Crable points out that corporate Web sites can receive thousands of product queries on a daily basis but the exchange of information from the Web and existing order fulfillment systems is typically a manual process. Workers must then reformat, search for, rekey or e-mail the electronic information where it needs to go.

The ease of administration is one of the software's strongest selling points, says Allison. "Even a huge system with a lot of different pieces can be administered to by one person at one machine. The integrator and mapper are very easy to use and very user friendly."

Although squarely behind the new software, Allison does have a wish list for inclusion in newer versions: "I would like, on the [Gentran] interchange, [to have the ability to] be able to set up the inbound interchange directory at the partner level instead of the system level. I'd like to see a mailboxing capability be included, which is coming out in the next version, and I'd like to see built-in encryption."

Gentran:Server for NT includes a process controller, responsive messaging, EDI translation, formatted message translation, a communications controller, message management, archiving, a graphical user interface, optional desktop clients and Web site access.

— Matt Hengey, Contributing Author

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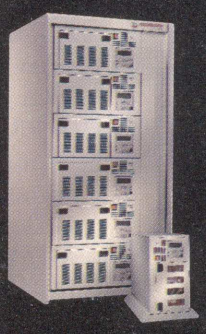

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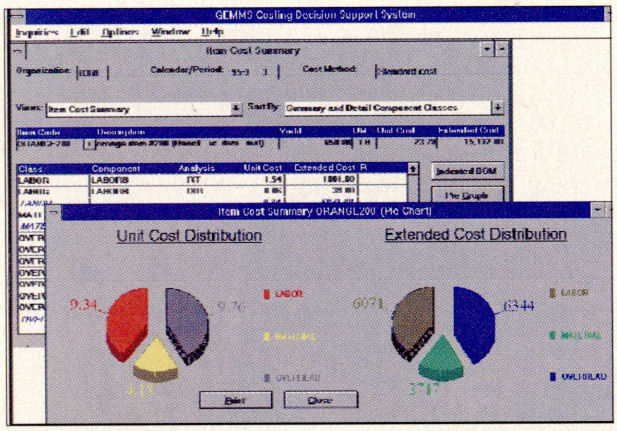
MEMORIES OF THE FUTURE

CIRCLE 249 ON READER CARD

Datalogix's Shop Floor Two-Step



GEMMS 3.2 AND CIMPRO

- GEMMS 3.2 runs experimental models and formulas using production data
- CIMPRO includes sets of core operational, advanced manufacturing, and regulatory compliance and laboratory modules
- GEMMS starts at $260,000; CIMPRO starts at $200,000

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CIRCLE 351 ON READER CARD

Once upon a time, running a factory and warehouse was a difficult operation. Actually, it still is. But with the right technology, at least document management is easier. Two products from Datalogix Int'l. Inc. (Valhalla, N.Y.), the Global Enterprise Manufacturing Management System (GEMMS) 3.2 and CIMPRO, eliminate the need for tons of paper and man-hours to be shuffled around among departments.

GEMMS is a suite of open, client-server applications for managing manufacturing operations of multinational manufacturers. It also can be used in conjunction with Oracle Financials, giving the user a combined manufacturing, logistics and financial solution. GEMMS uses the ubiquitous barcode to track inventory and pricing. The system enables production data to flow between the plant floor and its business offices.

As goods and material are moved across a shop floor that has barcode plates embedded in it, a laser reader captures part numbers, poundage and footage data for incoming raw materials. Production information is similarly recorded with wand barcode readers at each phase of the production cycle. The information is fed into GEMMS, which makes the data available in real time.

The program setup also gives manufacturers the chance to collect, record and analyze resource usage on the plant floor. A cost analyzer combines standard and actual cost data into a single view. Through a Windows interface, management can call up color charts and graphs based on these analyses to help with cost models on products in development.

Also, the advanced pricing feature allows manufacturers to give customers specific and personalized pricing online information. A manufacturer can create customer profiles based on the products purchased, which can be updated without losing the customer history.

Another GEMMS 3.2 capability is running experimental models and formulas using production data without interfering with actual production. It also can be used for purchasing, sales management, capacity planning, accounting and system administration.

Currently supported hardware and operating platforms include: HP-UX; IBM AIX; Digital UNIX; Data General DG/UX; Unisys UNIX; Sun Solaris; and Intel-based PCs. The cost starts at $260,000 for a 16-user license.

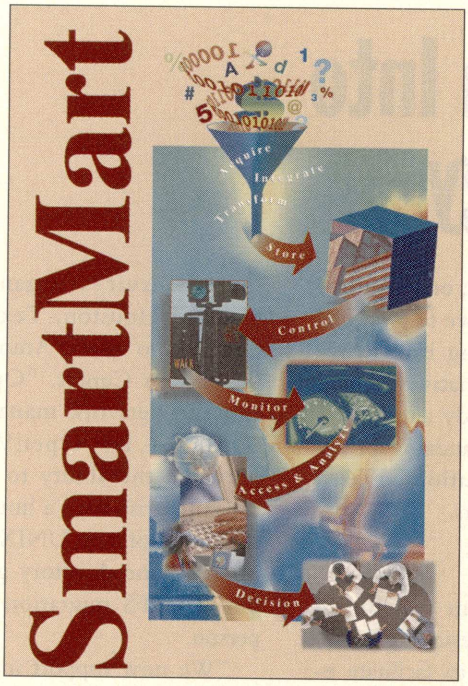
CIMPRO 5.0 is an application aimed at smaller process manufacturers. Not an entirely different product than GEMMS, CIMPRO's applications include sets of core operational modules, advanced manufacturing modules and regulatory compliance and laboratory modules.

The advanced manufacturing modules are designed to improve planning and production control. The regulatory compliance and labeling modules integrate other modules, as MSDS sheets, right-to-know labeling, DOT and SARA information are generated automatically. The CIMPRO lab module can provide "what-if" scenarios.

It runs on HP-UX, IBM AIX and OS/400, Digital VMS, MS-DOS and Bull DPS6. It also supports the IDOL database. CIMPRO pricing starts at $200,000.

—Steve Berlin, Contributing Author

That's One Smart Warehouse



SMARTMART

- Users can access SmartMart through a Web browser or a client-server front-end
- Available for HP-UX, AIX, Solaris and Windows NT
- The complete SmartMart: $76,400 for NT; $137,000 for all other systems

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CIRCLE 354 ON READER CARD

Interest in data warehousing technology is experiencing a growth spurt. But why now? According to Jon Deutsch, director of product marketing for data warehouse at Information Builders Inc. (New York, N.Y.), six years ago, to create an enterprisewide data warehouse was expensive, took a long time to deliver and often business management lost faith. Information Builders simplified the process with the introduction of SmartMart, a complete and integrated data mart that provides all of the software and services needed to build, manage and use a data mart.

Users access the SmartMart business analysis tool through a Web browser or a client-server front-end. SmartMart includes tools for database creation, data extraction and transformation, a multidimensional database, database middleware, data access and analysis tools, an information directory and warehouse management tools.

SmartMart's business analysis tools provide a point-and-click, visual toolset for managed reporting, drill-down and ad-hoc query. It lets developers create three-tier high-performance report procedures for client-server, and immediately port them to the Web without changes. Information Builders' EIS and data mining tools are optional. And, a database publishing option allows for the scheduled execution of reports, electronic bursting and distribution via Web servers or e-mail.

Its multidimensional data and indexing technology, partitioning and parallel query support, deliver flexible business views and consistent performance across a range of queries. In conjunction with its database middleware component, the SmartMart data extraction and transformation tool can be used to source and integrate data from more than 65 different types of files, including Oracle, Microsoft SQL-Server, IMS and VSAM. Options to extract from, or drill through, to the SAP R/3 system also are available.

SmartMart is available in four editions. The SmartMart Open Database Edition does not include the multidimensional database, which allows organizations to use any industry-standard RDBMS. The SmartMart Entry Level Edition does not include the client-server tools, Web analysis tools and the multidimensional database. This allows organizations to use any analysis tools which employ standard database access like ODBC and SQL*Net.

And finally, the SmartMart Ninety-Day Edition is a software and services package which allows organizations to get a data mart up and running in 90 days.

The Open Database, Entry-Level and Ninety-Day Editions are available for HP-UX, AIX, Solaris and Windows NT platforms. The Ninety-Day Edition is also available for Alpha VMS and Digital UNIX.

The Entry-Level Edition starts at $38,400 for NT and $74,300 for all other systems. The Open Database Edition is $53,300 on NT, and $126,100 on all other systems. The Ninety-Day Edition is $30,000. The complete SmartMart package starts at $76,400 for NT and $137,300 for other systems.

—Deborah Schwartz, Associate Editor

IN sites

Case Study Solutions

Amoco Drills Down Into Intranet Technology

Jon William Toigo

Amoco Corp. (Houston, Texas), long an innovator in harnessing information technology, can be viewed as a microcosm of corporate IT. In the late 1970s, the company co-developed PROFS with IBM, ushering in an era of mainframe-based office automation, electronic messaging and document management.

In the 1980s, the company spearheaded the search for mainframe alternatives — well before distributed systems became the rage. In the early 1990s, the company began exploring enterprise messaging with HP. Next, it moved to a client-server system. Now, Amoco is drilling into intranet technology.

Amoco does not innovate for the sake of technology. Each of its technology changes has been prompted by a compelling business need. Ultimately, what technologies have proven useful to Amoco have been co-opted by other companies that were less willing to be early adopters. For this reason, the company's latest move to intranet technology may be viewed as a harbinger of things to come.

FIRST, AN INFRASTRUCTURE

Amoco's leadership in technological innovation is marked by a willingness to try new technologies and to partner with vendors, such as HP, whose products pass the corporation's strident tests. According to Brian Foster, supervisor of Enterprise Messaging Services, once Amoco had decided to move to a decentralized computing infrastructure, a VM Alternatives Group was formed to study alternatives and to articulate standards for use in testing the solutions offered by different vendors.

HP OPENMAIL

A key requirement was for an enterprisewide messaging infrastructure — first, to facilitate e-mail between company offices and end users worldwide — replacing PROFS, and ultimately to handle application-to-application messaging. The company conducted comparative testing of HP OpenMail and another popular LAN-based e-mail product to identify which solution would best meet corporate needs.

Foster recalls, "Parallel pilots were conducted with 1,000 users each. The LAN-based e-mail pilot was scaled up to 1,000 users and failed to meet our performance standards. The HP OpenMail solution scaled up as promised and has grown into a reliable messaging backbone for the company. It was selected because it was based on open, industry standards and was scalable to the entire enterprise. It was designed from the enterprise down rather than from the workgroup up."

According to Foster, the decision to go with OpenMail proved fortuitous, and Amoco reorganized its business units and re-centralized IT management functions under the auspices of a shared services organization based in Houston, Texas. Says Foster, who directs Amoco's HP Operations Center, "OpenMail and the network management system — HP OpenView — provided the ability to support the enterprise with a limited staff consisting of two UNIX administrators, one directory guru and one PROFS migration support person.

"We now support more than 25,000 seats on 65 HP 9000 Series mail servers worldwide. By the end of 1997, with only a limited staff increase, that number will increase to 36,000 seats."

MIGRATION FROM PROFS

According to the team at Amoco, the relationship with HP solved many technical problems for the company. The presence of a workable distributed messaging capability helped to expedite the company's migration from PROFS. Through the use of PROFS Migration Tools from HP, Amoco was able to move notes, note logs, documents and distribution lists from PROFS into the OpenMail environment and shut down its mainframe. The migration from PROFS and the reallocation of VM resources to other tasks is expected to be completed in December 1997, according to Foster.

"Our total cost of ownership on OpenMail is well below that of PROFS when you factor in lower support staff requirements,

lower costs for servers, and so forth. We have found that eliminating the PROFS messaging infrastructure has reclaimed 25 percent of our VM resources for other uses. Plus, the implementation of OpenMail also added new capabilities, like the ability to transport binary attachments over the network. We couldn't do that with PROFS."

Foster is also pleased with the capability of HP OpenMail to work with a wide range of mail clients. He reports that cc:Mail was widely deployed within the business units of the company prior to the OpenMail decision and provided a familiar interface for end users. So Amoco decided to continue using cc:Mail's mail clients where possible. This decision made for a smooth implementation of OpenMail by reducing the end user learning curve. "OpenMail was transparent to the end users. They could continue to use the familiar cc:Mail client application commands to send and receive messages over the corporate network backbone."

GOING MOBILE

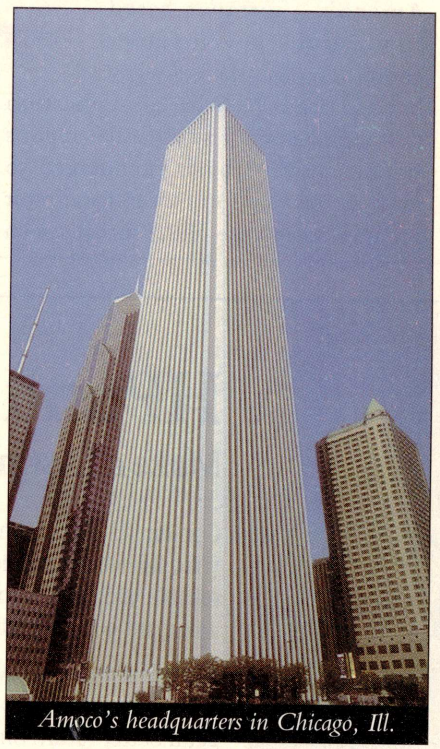
HP OpenMail also supported the cc:Mail mobile client, an advantage for Foster and Amoco's growing community of mobile end users, "We have about 50 mobile users now and expect that number to grow to about 3,000 shortly. Basically, these are end users who carry laptops with them. When they are in the office, they can connect up to their local area network and access the OpenMail server that way, then detach and disconnect and be on their way. When they are on the road, they can dial up to a secure network and upload or download mail using the cc:Mail mobile client software and OpenMail."

Where cc:Mail clients were not available, as was the case with engineering workstations and other UNIX platforms around the company, Foster reports that OpenMail's client application proved an effective alternative.

OpenMail's native client for the Microsoft Windows platform also had another use, Foster says, "We are processing more than 90,000 messages totaling 1.2GB to 1.5GB of data per day between our offices in the United States, Canada, Europe, South America, the United Arab Emerates, Egypt, China, the Pacific Rim and the former Soviet Union. We have deployed the OpenMail client for Microsoft Windows to some of our small remote sites where access to the nearest OpenMail server is provided via a 9,600bps satellite link because land lines are unavailable."

FROM INTERNET TO INTRANET

At Amoco, HP OpenMail contributed significantly to increased efficiency and reduced costs by facilitating the replacement of an aging legacy messaging platform. The OpenMail messaging infrastructure also has positioned Amoco to take advantage of Web technologies including the Internet.



Amoco's headquarters in Chicago, Ill.

Says Foster, "We use the Internet extensively to communicate with our joint venture offices in the former USSR. When the next release of OpenMail which provides Web browser access is released, it will be a real boon."

Using the Internet to supplement internal corporate messaging is not a strategy invented by Amoco. They admit "discovering the Internet about the same time that everyone else did."

Jamie Allison, process manager for Electronic Communications within Amoco's IT Shared Services Department, recalls, "We ran into Mosaic and the World Wide Web in 1994. In 1995, we formed a WWW Working Group and started to look at how we could use the Internet and how Internet technology might be applied internally using our existing messaging backbone. We have focused on developing an internal intranet since then, and it has grown by leaps and bounds."

A little more than a year later, with the help of HP, Amoco's Web experiment has evolved into an internal intranet comprising more than 20 dedicated servers, according to Gary McNitt, Amoco's supervisor of Internet Services. "We use our intranet to provide a discussion forum, to share documents, to publish annual reports and other memoranda, and for special applications," explains McNitt.

"Many business groups within the company use the intranet to promote their services," adds Bill Bryant, senior systems consultant. "An example is our graphics group, which offers its services to other business units. A user can find out about resources by using the Netscape browser to log on to the main intranet home page. There are predefined links on that page that will take you automatically to a number of other home pages throughout the company. We also have a Verity search engine and robot application that allows the user to search for information on our pages using key words."

Bryant is quick to point out that the Amoco intranet is separate from the company's Internet presence. "We have a public Web site, but that is completely separate from our intranet. To access the Amoco intranet, or to retrieve mail from our internal HP OpenMail server, our mobile users dial up through a toll-free number."

SURF'S UP FOR 3,000 USERS

Amoco's separation of its use of the Internet and its internal deployment of Web technology is a practical one, designed to provide security for confidential corporate information.

However, the Internet does play a role in day-to-day business operations.

McNitt observes, "We have more than 3,000 users who are accessing the Internet from within the company using their Netscape browser. We have deployed a firewall so that those who are authorized can pass through our firewall and access the [public] World Wide Web, but unauthorized persons on the Web can't enter our internal systems or networks."

McNitt acknowledges that the Internet provides a wealth of information that can be of use to Amoco employees engaged in business pursuits. However, when an employee lacks the time or business rationale for Web surfing, Amoco has copied a few general interest pages from the Web onto its intranet for general purpose browsing. These include weather reports, traffic reports and other Web information.

Whether it is used to surf the public Internet or explore Amoco's intranet, Amoco spokespersons report that the Web browser is becoming a commonplace component of the typical employee's desktop. The company is awaiting OpenMail's forthcoming Web client as well as its support for Netscape Navigator as a mail client to select and standardize on a browser. They report that this effort will coincide with the replacement of cc:Mail clients used by the company, an action necessitated by Lotus Development Corp.'s announcement that they will drop support for cc:Mail within a year.

"We use the Internet to communicate with our joint venture offices in the former USSR."

A BIG HITTER

A new Web browser standard will also ease the expansion of Amoco's intranet-based application development efforts. To date, the company has initiated Web-based application development on a small scale, reports Bryant, and has been encouraged to look at new opportunities to exploit the user acceptance of the intranet seen so far. "We have deployed one very successful application in particular: a searchable organization chart. One of our application developers found a reporting database within our payroll system and overlaid it with a clickable graphical org chart."

Bryant indicates that the full potential for the intranet at Amoco has only been scratched. "Our application developers are learning to exploit it only now." Foster adds that he expects new applications to be developed that will capitalize on the intranet's ease-of-use.

Amoco's application of intranet technology to business use defines the company as a classic early adopter of new technology. In the manner of a modern prospector, the company is willing to accept a few risks following careful testing if the potential payoff merits.

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Case Study Solutions

WorkManager Drives Engine Component Development

Dave Blackburn

From ignition systems and fuel injection to engine monitoring and diagnostic sensors, sophisticated electronic devices are essential to the operation of the contemporary automobile.

Motorola's Automotive and Industrial Electronics Group (AIEG; Northbrook, Ill.) designs and manufactures under-the-hood computer controls for many of today's cars, including specific models from Chrysler and Ford.

Although many of the products that the AIEG manufactures are electronic in function, each requires a protective housing. This requires the production of both mechanical and electrical design drawings.

Computer housings are made from plastic or one of a variety of metals. Regardless of the material used, resistance to heat, shock, stress and vibration are thoroughly analyzed. This process can result in scores of different designs, each requiring CAD drawings.

Electronic circuit boards routinely contain hundreds of elements. Here, too, many versions are generated. Unfortunately, the mechanical design that proves to be optimum rarely corresponds with its electronic counterpart; that is, version number three of the mechanical design might be paired with version number 15 of the electrical design. Revisions made during the approval process also require additional drawings.

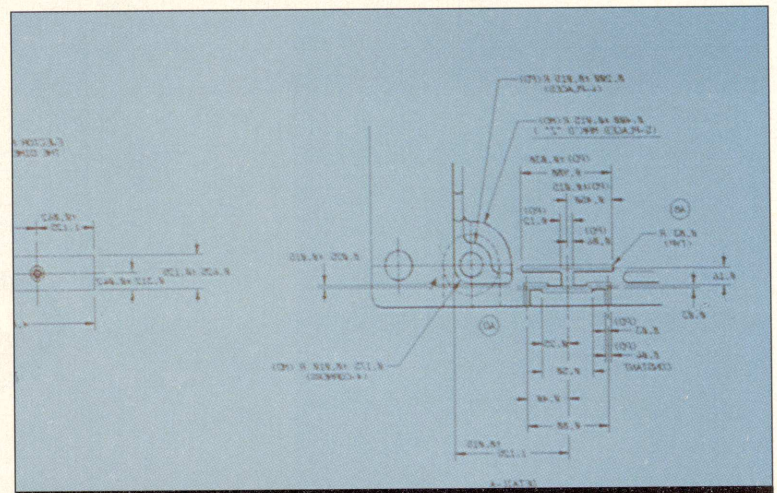
It is easy to see how complicated and confusing managing this information can become. That is why Motorola's AIEG installed software to help facilitate smoother data flow, retrieval, approval and revision, while simultaneously making sensitive corporate information more secure.

"Before Hewlett-Packard WorkManager went online, we basically had no data management system," says Richard Seehafer, senior software specialist. "We worked with a UNIX directory structure and some proprietary CAD software, but it wasn't a networked resource. There was no ability to share data and no coordination of data between the electrical and mechanical design groups."

He notes that the AIEG decided to purchase the data workflow management system for added efficiency, in the product life cycle.

"Our goal wasn't to design a new product in one-tenth the time it used to take, but to be able to work on 10 different projects simultaneously because we are working more efficiently," Seehafer says.

Central to improved workflow is the software system's work-in-progress structure, which allows engineers to place data into an electronic "vault" containing packets (or folders) of information.



HP WorkManager allows the AIEG to share and coordinate data between the electrical and mechanical design groups.

"The packet structure permits us to combine electrical and mechanical data," Seehafer explains. "For example, if version number three of an electrical drawing ends up being used with version number five of a mechanical drawing, each will be placed in the same packet."

Electronic routing lists and clearances for removing and replacing data in the vault can be

tailored to a project's specific needs. This is useful not only for tracking workflow progress, but for improving security.

Completed documents are routed to appropriate supervisors for electronic viewing and approval. If a design is approved, it goes into the system's release vault. If further modifications are required, it is returned to the designer.

Ease of installation, integration and configuration were the primary factors that Seehafer says prompted him to purchase HP's WorkManager. The system is networked via Ethernet TCP/IP for UNIX and Novell for PCs.

"It runs on a true client-server," Seehafer says. "There is only one database, which eliminates the need for synchronization between network systems, which can cause difficulties."

When integrated with design software, such as Pro/ENGINEER, HP's WorkManager permits the program to work within the application. "The designer is not required to constantly enter and exit various programs," Seehafer says. "It's superior to mere software compatibility."

Seehafer, himself, learned the mechanics and theory of the system at a five-day training course. He created his first custom template in one week; the second took him six hours. "I don't claim to be a programmer," he says. "Yet I could have incorporated a lot more intelligence into the templates."

Seehafer says it's hard to predict the payback on the software. "Traditionally, engineering firms have measured the value of new software by the number of staff reductions it enabled them to make," he says. "The data management software is different — it doesn't replace anyone, it just helps us work more efficiently.

There will, however, be a monetary savings, because new drawings are no longer being added to the AIEG'S blueprint room. That frees expensive storage space for more productive purposes.

Then, too, Motorola's manufacturing facility in Texas has been brought online, which saves both money and time. Before the implementation of the software, approved designs were plotted, placed in a mailing tube and shipped via overnight courier. It required a two-day turnaround. Today, it is a virtually instantaneous process. Being able to share information via the network means that bluelines are no longer required, saving a day or more during the release process.

Maintaining good data flow as new employees join the company also becomes easier; its just a matter of electronically shifting data among groups and adding names to the access list.

"HP's WorkManager is so flexible and offers so much intelligence, we have just scratched the surface of its capabilities," Seehafer says. "It will take more time for us to realize the full benefits of what it can do."

— Dave Blackburn, Contributing Author

A Klud Beyond Relief

Integrating Windows NT And UNIX

ge

Peter Auditore

Windows NT is like a tsunami. Never before has the computer industry witnessed such a rapid adoption of new technology. However, the success of Windows NT has created much chaos and confusion, particularly in the UNIX enterprise marketplace. This poses a major challenge to network managers and administrators who are seeking to integrate Windows NT within the multivendor enterprise internetwork.

A trade publication recently published a quote from a university department head which stated "At this point, trying to forge connectivity between Windows NT networks and large UNIX systems is a kludge beyond belief." This might be true if one depended solely on Microsoft technology; however, a rich array of third-party technology based on open industry standards is currently available. (see chart on page 34 for over 50 third-party vendors and their products)

Many of the foundation technologies that enable cross-platform integration in enterprise environments have been developed by the UNIX community. These technologies are considered open industry standards and provide interoperability. The technologies of the Internet/Web were also developed by the "open systems" UNIX community, and although they are operating system- and platform-independent, at this time they offer limited functionality to enterprise systems

managers searching for Windows NT and enterprise computer system independence. Successful coexistence of Windows NT systems in the enterprise internetwork is dependent on implementation of the rich suite of enabling technologies.

NT Doesn't Do UNIX

Because today's enterprise internetwork is multivendor, interoperability — the ability to share data and ultimately information, between different computer systems — has become a critical requirement for internetworking software. Interoperability is a major issue with Windows NT, and many network managers have been faced with the stark reality that when an NT node is added to the network it only sees other Microsoft nodes — a la NetBEUI.

Compounding this issue is NT's limited support for the Domain Name System (DNS), and the overall lack of TCP/IP utilities and applications.

For example, there is no support for one of the world's most powerful and successful multivendor internetwork connectivity technologies, the X Window System. The X Window System's ability to connect to many different types of computers has made it one of the most powerful Windows NT and UNIX integration technologies. So to address many Windows NT and UNIX integration issues, organizations have turned to third-party vendors of open systems standard software, such as DNS, TCP/IP applications and internetworking software, to enable access to enterprisewide information and applications.

Corporations have invested millions over the past 10 years in developing mission-critical applications on the UNIX-based enterprise servers that now run their businesses.

According to IDC (Boston, Mass.), currently 80 percent of all enterprise servers are UNIX-based, and the implementation of UNIX-based enterprise servers is expected to grow at a compound annual growth rate (CAGR) of 20 percent over the next several years. So, the immediate impact of Windows NT has been primarily on UNIX desktops and workgroup file, print and application servers, *not UNIX enterprise servers*.

One criticism that is consistently overlooked is that Windows NT was not designed to be a multiuser operating system. This severely limits its capability as an enterprise server. Windows NT is a multi-console operating system that can be customized to deliver multiuser capability only by adding Citrix's (Coral Springs, Fla.) ICA protocol or Insignia Software's (Santa Clara, Calif.) NTrigue server to Windows NT servers.

And a multiuser Windows NT implementation requires a significant hardware investment — a new dedicated server with a minimum of 8MB of RAM per remote user. The majority of enterprise desktops accessing the rich suite of Windows applications today appear to be primarily UNIX workstations, Macintosh and X terminal users.

Threats And Opportunities

Nevertheless, widespread deployment of Windows NT servers as workgroup servers is underway, and many organi-

CD-RECORDABLE STANDARDS MAKE UNIX/ WINDOWS NT INTEROPERABILTY EASIER

Until recently, the only writable, random-access file system which users could conveniently interchange between many different computer systems was a formatted 3.5-inch disk. The only other random-access file system which is supported on a wider variety of computer systems than the disk is the ISO 9660 standard format used to read CD-ROMs. Products supporting the write-once version of this technology, known as CD-Recordable (CD-R), are now available for both Windows NT and many versions of UNIX, including HP-UX.

But the basic ISO 9660 format limits the characters which may be used for file and directory names to upper case letters, digits and the underscore character. Further, "Level 1" implementations (the most common) restrict file names to an eight-character maximum, with an optional extension of up to three characters. Because most file names used in UNIX and Windows NT environments violate these rules, it is often inconvenient to transfer data sets to an ISO 9660 disk. Both UNIX and Windows NT systems have addressed this problem, but in different ways.

In 1990, major UNIX system vendors participated in the development of the Rock Ridge Protocols, which: 1) provided a mechanism by which any vendor could record additional system-specific information within the normal ISO 9660 directory structure, using space provided for this purpose, and 2) used this mechanism to record complete UNIX/POSIX file system information. These protocols have received support not only from the UNIX community, but also from other platforms.

While Microsoft could easily have adapted this mechanism to support the needs of Windows NT, they invented their own approach, known as the Joliet file system extension. The primary goal of Joliet was to provide support for the ISO 10646 (a.k.a. Unicode) system for recording international character sets. In creating Joliet, Microsoft used a second, supplementary directory structure defined by the ISO 9660 standard, and "modified" it to suit its needs, casually changing or ignoring rules imposed by the standard which it felt were inconvenient or unnecessary.

Though this divergence is unfortunate, at least the approaches are compatible enough to peacefully coexist. A correctly constructed ISO 9660/Rock Ridge/Joliet formatted disc will serve the needs of both the UNIX and Windows NT communities, plus the many users of computers with basic ISO 9660 file system support. Though this is not the ideal solution to the multiplatform interoperability problem, it is a functional one, at least for now. Packet-write CD-R and future CD-Rewritable (CD-RW) drives will use the OSTA Universal Disk Format (UDF) file system, a version of the ISO 13346, which may offer an opportunity for the industry to regroup behind a single file system standard again.

— Andrew Young is chairman of Young Minds Inc. He can be reached at young@ymi.com.

TABLE 1: WINDOWS NT WORKSTATION INTEGRATION GOALS AND SOLUTIONS

Goal	Solution
Access character-based UNIX applications from the NT desktop.	Implement third-party terminal emulation software on the Windows NT desktop.
Access graphical UNIX applications from the NT desktop.	Implement third-party PC X server software on the Windows NT desktop.
Access legacy IBM applications from the NT desktop.	Implement third-party IBM TN3270 & TN5250 emulation software on the Windows NT desktop.
Access files resident on UNIX NFS servers from NT desktop.	Implement third-party NFS client software on the Windows NT desktop.
Share files between NT workstations and UNIX workstations and Macintosh systems.	Implement NFS server software on Windows NT servers.
Run UNIX applications on Windows NT servers.	Port UNIX application to Windows NT with X Window System development tools.
Distribute Windows NT and Windows applications over the organizational internetwork	Implement third-party encapsulation and server distribution technologies on Windows NT servers.
Access or run 3D applications from network computers on Windows NT workstations or locally on the NT desktop.	Implement GLX X Window extension on the Windows NT Workstation along with X server software.
Integrate Windows NT workstations and desktops into the internetwork.	Implement TCP/IP and WINS/DNS gateway on the Windows NT Workstation and Server.

zations are implementing Windows 95 desktops and controlling application access through NT servers. Windows NT may be a threat to UNIX workstation vendors, but it really represents an opportunity for third-party suppliers of porting and application development tools, middleware and internetworking software. According to IDC, the market for Windows NT workstations is expected to grow at a CAGR of 48 percent through the year 2000.

So a huge opportunity lies in providing Windows NT workstations and servers with integration technologies based on open systems standards such as the rich TCP/IP protocol suite, the X Window System, the Network File System (NFS) and Web technologies that enable interoperability in today's multivendor internetwork environments. However, until Windows NT achieves the robustness, scalability, clustering, 64-bit processing and multiuser capabilities of UNIX, it will have a limited impact on enterprise UNIX servers that deliver mission-critical information and applications to enterprise desktops.

UNIXIFICATION OF THE MARKET

Third-party software vendors are rapidly developing a rich array of integration technologies based on open industry internetworking standards. The hallmark of the UNIX platform is a highly functional and agreed upon set of open standards enabling interoperability.

There are products available that provide Windows NT with full POSIX compliance, UNIX shells, UNIX-to-NT application porting and development tools, TCP/IP application suites, DNS for the Windows NT workstation and server, and even 3D-capable PC X servers. Interestingly, these third-party enabling technologies are in reality "UNIXizing" the Windows NT platform in the following ways:

Foundation Communication and Integration

- TCP/IP — a rich routable protocol suite enabling LAN-WAN-GAN, connectivity and information access.
- Third-party DNS, UNIX shell and POSIX compliance.

Legacy Application and Database Access With Emulation

- VT52-VT420 character emulation, HP 3000-9000 emulation.
- TN3270 & TN5250 IBM mainframe and minicomputer emulation.
- PC X Windows emulation.
- Other legacy terminal emulation such Wyse 60, etc.

Migration of UNIX Applications to Windows NT

- Porting of UNIX applications to NT as native Windows NT applications.
- Porting of UNIX applications to NT as UNIX character applications — maintain UNIX interconnectivity.
- Porting of UNIX applications to NT as X Windows/UNIX application — maintain X Windows interconnectivity and interclient communications.

File System Integration

- Implementation of the Network File System.
- Implementation of DCE's DFS.

System Management

- Windows NT Server DHCP support and Workstation Bootp support
- Implementation of UNIX Inet daemon suite.

Based on 50 enterprise customers who are in the process of integrating Windows NT and UNIX systems and several NT-UNIX integration seminars that I conducted at various trade shows

during the year, *Table 1* lists some of the most common issues encountered.

In The TCP/IP Haystack

The TCP/IP protocol suite and its associated open industry standards such as X Window and NFS have become key enabling technologies easing the integration of Windows NT and UNIX systems. However, the PC TCP/IP and internetworking software market is now undergoing a major transition as a result of Microsoft's inclusion of TCP/IP in the Windows 95 and Windows NT operating systems. This represents a change in the market's evolution; the majority of large enterprises are no longer buying TCP/IP stacks.

Consequently, the PC TCP/IP stack business is now a commodity market because of Microsoft. Proprietary protocols that once delivered the basics (file, print and application services) of networked PC users are no longer needed. Although Microsoft has integrated the TCP/IP stack in Windows 95 and Windows NT operating systems, they have not included many of the TCP/IP applications that networked enterprise desktops require. Herein lies the opportunity for third-party developers. (See chart on page 34)

Microsoft's rapid adoption and integration of Web technologies into the NT workstation and the desktop has been a major impetus. However, NT's support for the interoperable technologies of today's enterprise internetwork remains limited. Beyond the basic TCP/IP stack, and NT-to-NetWare integration, Microsoft has included only rudimentary FTP and telnet clients and most recently a FTPd and Telentd daemons in the latest NT resource kit, and also accessible in the network software section of NT's control panel. *(see Table 2.)*

Where 4 Art Thou

Achieving coexistence with Windows NT servers in enterprise internetworks has represented a significant challenge to enterprise administrators, primarily because of its limited support for open standard protocols and communication technologies of the internetwork, such as DNS, NIS and the TCP/IP protocol suite. Although Microsoft has addressed some of these issues with Windows NT version 4.0, especially the DNS issue, many organizations are not upgrading to NT 4.0.

NT server's support for DNS has been a major issue which many enterprise managers have addressed by implementing third-party DNS solutions. Additionally, remote administration of Windows NT servers is an issue with many administrators, that has been addressed by implementing the Inet daemon suite. Many enterprise customers who have implemented Microsoft networking also have been surprised to find that they cannot control Windows users' access to network-based peripherals such as high-end plotters and printers. To regain control of peripherals, enterprise administrators have implemented third-party TCP/IP application suites that include the NFS. *Table 3* depicts issues and solutions that I've encountered during customer visits and presentations during the year.

Inet Daemon Server Suite

Some TCP/IP products for Windows NT have been optimized by incorporating several important aspects of UNIX, such as the Inet daemon. The

Table 2: Third-Party TCP/IP Application Suite for Windows NT

General Applications

Telnet — remote login protocol or virtual terminal.
FTP — text and binary file transfer.
Electronic mail client.
Network News client — provides access to network news groups.
Internet Relay Chat (IRC) client.
Web browser — provides access to Web servers and usually supports the gopher protocol.

Diagnostic Tools

Finger — provides information on which users are active on a server.
Ping — determines whether a computer is connected to the network.
Traceroute — traces the path of data packets across networks, and is especially useful for troubleshooting routing difficulties.
NSLookup — name service lookup for a specific computer or network domain, can also be used for DNS queries.

Administrative Utilities

cookie — utility to return a quotation.
DHCP — enables dynamic IP addressing.
Inet daemon server suite.
UNIX "r" commands — enable users to run commands from Windows NT for quick and easy access to remote network computers.
talk — utility that communicates between computers over the network.
exports — displays remote NFS file systems available for mounting.
wiki — paging utility enables messages to be sent directly to a paging system.
rpcinfo — list remote procedure call processes running on a remote server.
whois — query utility enables lookup of users from network database.
tar — allows users to easily transfer entire directories and their contents to an archive file.
Basic Scripting Language — with APIs for FTP and telnet, providing mechanism for sophisticated application development and task automation.

Advanced TCP/IP-Based Applications

Network File System client — access to NFS file servers, CD-ROM drives and network printers.
PC X server — connectivity to graphical X Windows-based UNIX applications.
TN3270 client — IBM 3090 connectivity.
TN5250 client — IBM AS/400 connectivity.
Terminal emulation — providing VT320, VT340, HP, Wyse and SCO ANSI connectivity.

TABLE 3: WINDOWS NT SERVER INTEGRATION GOALS AND SOLUTIONS

Goal	Solution
Integrate NT servers with the enterprise internetwork.	Implement WINS/DNS gateway or third-party DNS and NT 4.0 IIS
Enable NT servers to share files with multivendor workstations and servers.	Implement third-party NFS server software or SMB server freeware.
Provide NT servers with a multiuser capability.	Implement third-party Citrix-based WinFrame or Insignia-Tektronix technology.
Distribute NT and Windows applications to other Windows Desktops.	Implement third-party Citrix-based WinFrame and other multiuser technologies.
Distribute NT and Windows applications to non-Windows desktops UNIX, Macintosh and X terminals.	Implement third-party X Windows encapsulation technology (Tektronix WinDD) on Windows NT servers.
Run UNIX applications on Windows NT servers.	Port UNIX application to Windows NT servers with X Window System development tools.
Enhance Windows NT administration and internetwork functionality.	Implement third-party Inet daemon and NFS server on Windows NT Server.
Add UNIX shell and POSIX compliance to Windows NT server.	Implement third-party UNIX shell and POSIX functionality.

Inet daemon server suite (see *Table 4)* was created to improve the efficiency of UNIX and TCP/IP by reducing the number of processes activated during system startup, many of which are not continuously required. Inetd continuously runs as an active process waiting for client connection requests. Upon receiving the request, Inetd starts up the appropriate server daemon on demand (telnetd, FTPd, etc.), thereby conserving server or workstation resources.

Commonly referred to as the Internet service daemon, complete Inetd server suites are only provided by a few developers of TCP/IP application suites for the Windows NT Workstation and Server. A full Inet daemon server suite provides the Windows NT platform with the full functionality of a UNIX workstation, enabling the PC desktop or server to provide client-server TCP/IP functions. This facilitates peer-to-peer connectivity among NT workstations and workgroups using TCP/IP applications.

Inetd also provides valuable management utilities by enabling network managers and administrators to telnet into an NT workstation or server. Many enterprise network managers are using Inetd as a management utility. The value and functionality of Inetd is often underestimated and overlooked because it is a background service. In contrast to UNIX-based RISC processors, Intel desktop platforms may have limited hardware resources.

As an NT Workstation user, I have noticed much NT background services compound and impact my desktop performance.

—Peter Auditore is director of marketing at Hummingbird Communications Ltd.(North York, Ontario).

TABLE 4

INET DAEMON - TCP/IP SERVER SUITE AND FUNCTIONS

Finger server — Services client inquires as to who is logged on

FTP server — Supports FTP client file transfer

Gopher server — Supports gopher client searches and menus

LDP server— Supports PC client UNIX Line Printer Requests

New Talk server — Supports (New Talk) UNIX chat facility

Bootp server — Supports remote TCP/IP configurations

RSH server — Supports requests to execute command on a remote system

Talk server — Supports user (Old Talk) UNIX Chat facility

Telnet server — Services Telnet client (virtual terminal) sessions

TFTP server —Provides file transfer for diskless workstations

Trival name server — Services host to IP address translations (name resolution)

Time server — Synchronizes client time with other NFS servers

HTTP server — Enables broadcasting of Web pages

Exec Server — Provides remote execution services

Login server — Provides remote login services

Time of the day server — Provides time of the day

Who Ya Gonna Call?

Representative solutions for Windows NT-to-UNIX integration. See how to contact vendors on *page 37*.

COMPANY	PRODUCT
APPLICATION DEVELOPMENT	
Anysoft	ANY DataRouting Technologies
Blyth Software	OMNIS Enterprise Edition, OMNIS Server Edition, OMNIS Workgroup
Bristol Technology	Wind/U Version 3.2
Cornerstone Software Inc.	Piccolo
DataFocus Inc.	Nutcracker
Mortice Kern Systems Inc.	MKS Toolkit 5.1
Nat Systems Int'l. Inc.	NatStar
NobleNet Inc.	EZ-RPC
Ryan McFarland	RM/COBOL version 6.5
Software AG	Natural, DCOM
COMMUNICATIONS	
BLAST Inc.	BLAST
DATABASE TOOLS	
Audre Inc.	Convert 2000 V4.0, Pattern Detective V4.0, MapFlex 2000 V4.0, VuFlex 2000 V4.0, CADFlex 2000
Dimensional Insight Inc.	CrossTarget
02 Technology Inc.	02DBAccess
The Santa Cruz Operation Inc.	SCO SQL-Retriever
DATABASES	
Microsoft Corp.	Microsoft SQL Server
E-MAIL/GROUPWARE	
Computer Mail Services Inc.	S-Bridge NT for MS Mail, S-Bridge NT V2.0 for cc:Mail
MetaInfo	Sendmail with POP3 for Windows NT
TriTeal Corp.	TriTeal Enterprise Desktop (TED)
INTERNET	
Dimensional	Insight DataFountain
NETWORK CONNECTIVITY	
Andyne Computing Ltd.	Andyne GQL
Attachmate Corp.	Extra! for Windows NT V6.1, Extra! Office Client v6.1, Extra! Personal Client V6.1, KEA!
Century Software	TinyTERM

COMPANY	PRODUCT
NETWORK CONNECTIVITY cont'd.	
Citrix Systems Inc.	WinFrame/Enterprise
Computer Network Technology Corp.	Brixton 3270 Open Client
FacetCorp.	FacetWin
Frontier Technologies Corp.	CyberJunction, SuperTCP Suite 96, SuperNFS
FutureSoft	DynaComm Connectivity Series
Harbinger Corp.	TrustedLink Enterprise NT
Hummingbird Communications Ltd.	Exceed 5, Exceed 3D, NFS Maestro, NFS Maestro Server for Windows NT
Insignia Solutions	NTrigue, SoftWindows for UNIX 2.0
Intergraph Corp.	DiskAccess Verison 3.0
MiniSoft Inc.	MiniSoft 92 V4.0
NCD Software Corp.	Marathon, PC-Xware
NetManage	ChameleonNFS/X
Network Computing Devices	Wincenter Pro
Pericom	Teemtalk-TCP/IP
Persoft Inc.	SmarTerm
The Santa Cruz Operation Inc.	SCO Advanced File and Print Server, SCO TermVision, SCO Xvision, SCO Vision FS
Software AG	Entire Net-Work
Tektronix	WinDD X Support
UniPress Software	PowerTerm
Veri-Q Inc.	VCOM Client for Applets
Wall Data Inc.	Rumba
White Pine Software Inc.	5PM Term for HP Systems
WRQ	Reflection X, Reflection 1, Reflection 2 and 4

NETWORK MANAGEMENT	
Compu-Design Group Inc.	LANutil, LANutil 32, SysMaster
Esker Inc.	TunPLUS 8.50
Fast Track Inc.	Expose 3.10
Legato	NetWorker V4.1
Network Instruments	NIPrint, SNMP Collector, Winsock Companion

SYSTEM MANAGEMENT	
BMC Software	NetTUNE PRO 3.0
Computer Associates Int'l. Inc.	CA-Unicenter
Diamond Optimum Systems	Version Control System (VCS) V4.5
Microsoft Corp.	Systems Management Server
NetSuite	NetSuite Professional Audit
Softway Systems Inc.	OpenNT X11 Server
Systemetrics Inc.	Sentry
W. Quinn Associates	Storage Advisor

Company Contact Information

Andyne Computing Ltd.
Kingston, ON
(613) 548-4355
www.andyne.com

Anysoft
Cambridge, MA
(617) 868-3397
www.anysoft.com

Attachmate Corp.
Bellevue, WA
(206) 644-4010
www.attachmate.com

Audre Inc.
San Diego, CA
(619) 451-2260
www.audre.com

BLAST Inc.
Pittsboro, NC
(919) 542-3007
www.blast.com

Blyth Software
Foster City, CA
(415) 571-0222
www.blyth.com

BMC Software
Houston, TX
(713) 918-8800
www.bmc.com

Bristol Technology
Ridgefield, CT
(203) 438-6969
www.bristol.com

Century Software
Salt Lake City, UT
(801) 268-3088
www.censoft.com

Citrix Systems Inc.
Coral Springs, FL
(800) 437-7503
www.citrix.com

Compu-Design Group Inc.
Natick, MA
(508) 655-1177

Computer Associates Int'l. Inc.
Islandia, NY
(800) 225-5224
www.cai.com

Computer Mail Services Inc.
Southfield, MI
(800) 883-2674
www.cmsconnect.com

Computer Network Technology Corp.
Minneapolis, MN
(800) NET-TECH
www.cnt.com

Cornerstone Software Inc.
Nashua, NH
(603) 595-7480
www.corsof.com

DataFocus Inc.
Fairfax, VA
(703) 803-3343
www.datafocus.com

Diamond Optimum Systems
Woodland Hills, CA
(818) 224-2010
www.diamondos.com

Dimensional Insight Inc.
Burlington, MA
(617) 229-9111
www.dimins.com

Esker Inc.
San Francisco, CA
(415) 675-7771
www.esker.com

FacetCorp
Plano, TX
(800) 235-9901
www.facetcorp.com

Fast Track Inc.
A Division of Symantec
Cupertino, CA
(800) 441-7234
www.ftinc.com

Frontier Technologies Corp.
Mequon, WI
(414) 241-4555
www.frontiertech.com

FutureSoft
Houston, TX
(800) 989-8908
www.fse.com

Harbinger Corp
Atlanta, GA
(800) 990-7971
www.harbinger.com

Hummingbird Communications Ltd.
North York, ON
(416) 496-2200
www.hummingbird.com

Insignia Solutions
Santa Clara, CA
(408) 327-6000
www.insignia.com

Intergraph Corp.
Huntsville, AL
(800) 345-4856
www.intergraph.com

Legato
Palo Alto, CA
(415) 812-6000
www.legato.com

MetaInfo
Seattle, WA
(206) 521-2600
www.metainfo.com

Microsoft Corp.
Redmond, WA
(800) 426-9400
www.microsoft.com

MiniSoft Inc.
Snohomish, WA
(800) 682-0200
www.minisoft.com

Mortice Kern Systems Inc.
Waterloo, ON
(800) 265-2797
www.mks.com

Nat Systems Int'l Inc.
McLean, VA
(703) 760-0900
www.natsys.com

NCD Software Corp.
Beaverton, OR
(503) 641-2200
www.ncd.com

NetManage
Cupertino, CA
(408) 973-7171
www.netmanage.com

NetSuite
Wayland, MA
(508) 647-3100
www.netsuite.com

Network Computing Devices
Mountain View, CA
(415) 694-0650
www.ncd.com

Network Instruments
Minneapolis, MN
(612) 932-9899
www.netinst.com

NobleNet Inc.
Southborough, MA
(800) 809-8988
www.noblenet.com

O2 Technology Inc.
Palo Alto, CA
(415) 842-7000
www.o2tech.com

Pericom Inc.
Lawrenceville, NJ
(609) 588-5300
www.pericom-usa.com

Persoft Inc.
Madison, WI
(608) 273-6000
www.persoft.com

Ryan McFarland
a Div. of Liant
Austin, TX
(800) RM-COBOL
www.liant.com

The Santa Cruz Operation Inc.
Santa Cruz, CA
(800) SCO-UNIX
www.sco.com

Software AG
Reston, VA
(703) 860-5050
www.sagus.com

Softway Systems Inc.
San Francisco, CA
(800) 438-8649
www.softway.com

Systemetrics Inc.
Cambridge, MA
(617) 868-8308
www.system.com

Tektronix
Wilsonville, OR
(800) 547-8949
www.tek.com

TriTeal Corp.
Carlsbad, CA
(619) 930-2077
www.triteal.com

UniPress Software
Edison, NJ
(800) 222-0550
www.unipress.com

Veri-Q Inc.
San Francisco, CA
(415) 908-1313
www.verimation.com

Wall Data Inc.
Kirkland, WA
(800) 915-9255
www.walldata.com

White Pine Software
Nashua, NH
(603) 886-9050
www.wpine.com

W. Quinn Associates
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(703) 758-0707
www.wquinn.com

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(800) 872-2829
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Push Me, Pull You

When It Comes To UNIX And NT, Are Two Heads Really Better Than One?

Editor's Note: HP has been furiously feeding its UNIX head as its primary growth beast for more than five years. And until recently, it seemingly denied the possibility of yet another head that needs to be fed — an NT head pulling it in the opposite direction. This report is excerpted from Summit Strategies' (Boston, Mass.) July 1996 Executive Briefing entitled "Hewlett-Packard's Strategy for Integrating NT into its UNIX Business Model: Powerful Lessons for UNIX Vendors."

In May 1996, HP modified its mission from being the best at providing UNIX-based enterprise solutions, to being the best at providing *integrated UNIX/NT solutions* to the enterprise. HP reorganized to drive a closer cooperation between its traditionally separate UNIX systems and PC groups, reorganized its sales organization to facilitate combined NT/UNIX sales and assigned its software and services groups to enable this integration.

Other changes are equally profound: HP is phasing out its PA-RISC CPU in favor of a new family of 64-bit processors it is designing with Intel. It will use this chip as the foundation for all of the next-generation systems, which will support HP-UX and NT, as well as run common applications.

HP is also putting its software where its hardware and services are, increasingly using their own middleware (OpenView, OpenMail and MC ServiceGuard) and third-party products like Novell NDS and Netscape SuiteSpot as glue to facilitate integration between its UNIX and NT product lines. And now for the first time, HP's UNIX-centric salesforce can create demand and take orders for HP's PC products; however, third-party channels continue to deliver them.

Thomas Kucharvy

But nagging questions remain: Will HP really risk diluting — and ultimately jeopardizing — the very viability of its traditional, highly successful UNIX focus? If HP is serious about NT, how big a force will the vendor really become in the market?

HP is smart. It recognizes that Microsoft has put together an unbeatable value proposition — what Bill Gates refers to as the "positive feedback loop" and what Summit Strategies refers to as the "virtuous cycle." Microsoft pricing and marketing models generate partner and market support, as well as sales volumes that force other vendors to change the way they compete.

While the UNIX business will continue to experience growth at the high end, NT gains at the low end will be tremendous. The greatest opportunity is selling UNIX/NT solutions and providing products and services required to integrate both into comprehensive environments that combine the best of both worlds.

See What Position My Position Is In

HP is positioned well to sell NT-based systems. Its PC group (the PPG) has rapidly grown into the sixth largest PC vendor, third largest PC server vendor and a strong Microsoft partner. Meanwhile the company's systems group, the Computer Systems Oganization (CSO), has established relationships with and credibility among CIOs and MIS executives.

That having been said, HP must overcome the following four challenges:

1. Hewlett-Packard Company

HP may be its own worst enemy. Given HP's typical attention to execution, there is little doubt that it will thoroughly train its people and partners, while preparing its customers, and fine tuning its marketing and compensation efforts. Yet, developing a successful business model around this NT effort is all together different. The hard part will be in managing this transition without gutting its traditional high-touch, high-margin business model.

2. Partners

Microsoft still harbors some "ill will" toward HP for the CSO's adamant anti-NT stance a few years back. In addition, Microsoft doesn't necessarily buy into HP's UNIX/NT integration strategy. Microsoft wants to displace UNIX, not integrate with it. So, while Microsoft is cooperating with HP in a number of joint training, marketing, and sales and support programs, it's withholding the kind of technical support and joint product development that HP requires for full integration. As a consequence, HP has been left to fashion much of this integration itself, through its own, as well as third-party middleware.

3. Competitors

HP is not the only source of UNIX/NT integration. Compaq has a much broader market exposure and a deeper commitment to NT than does HP. It also works closely, and unlike HP, does not compete with many systems integrators who can provide UNIX plan-

ning, integration and support service that at least match those of HP.

4. Customers

HP faces the same obstacles that stalled Digital, NCR and Sequent efforts to establish strong NT market positions: customers were not prepared to deploy NT. However, HP's currently large customer base would certainly be predisposed to consider HP as a preferred source for NT/UNIX integration.

Implications And Opportunities For HP And Its Partners

HP fully understands and has demonstrated its ability to thrive within the rules of both the UNIX and Windows markets. However, these were last-generation rules, and HP recognizes that NT Server will change the rules in both the high-end PC and UNIX server segments. Certainly, HP is not the only vendor to recognize these changes. But HP is arguably the best-positioned vendor to integrate the push-based UNIX and pull-based PC business models.

If HP's new initiative fails, its position will not be much worse than if it never tried. However, if the initiative succeeds, HP has the potential of redefining the rules by which the entire open server industry, both UNIX and NT, will compete, thereby forcing others to either adapt to these rules or define new sets of rules.

HP's UNIX/NT integration initiative also could have profound implications for HP partners. For example, the new HP could help software developers who are developing OS-independent business models, enterprise developers who want to leverage their UNIX strengths into NT, and higher-end PC developers who want to move upstream to UNIX. The only major gap in HP's ability to play this role is its current lack of focus on the requirements for developing an integrated distribution model. Hopefully, Dick Watts, HP's CSO vice president, who has a background in distribution, will recognize the importance of this area and dedicate the effort required to address it.

Although HP is currently in a strong position to execute its UNIX/NT integration strategy and its longer term hybrid business model strategy, success is by no means a lead pipe cinch. No one can say for sure if HP will succeed in its belated effort to embrace and then extend NT to its own advantage. After all, there are no guarantees in any period of rapid change. But one thing *is* certain — HP is positioned to shape and thrive in this new world, as well as any of its competitors. And, in Summit Strategies' mind, HP is probably *the best positioned* of any of them.

Thomas Kucharvy is president of Summit Strategies, and a member of HP Professional's Editorial Advisory Board. You can find him at: www.summitstrat.com

Fred Mallett

Respect Xauthority

As people migrate to using X11R5 and above, it is becoming more common to see programs that use the user-based display security mechanism known as Xauthority, instead of the old **xhost** host-based mechanism. Under **xhost**, any process on an "allowed" host was able to open a window to a display controlled by an X server program running on that host. In other words, if I was logged into HP VUE, anyone who could rlogin or telnet to the machine hosting my session could run a program, and have it displayed on my machine.

This was not very secure. Not because you could pop up pictures I did not want; annoying? yes. system security problem? no, but because a crafty programmer could "borrow" my account while I was logged in (sorry, I'm not tellin' how).

As of X11R4, a new security method was created, called Xauthority, which was user-based. This means that any process which was running as the user that owns the display can open windows on it. The process just has to prove that it was started by the same user that owns the display, no matter where it is running.

TO XHOST OR NOT TO XHOST

Most currently shipping X clients use Xauthority. That's why it's worth learning, as you no longer have to rely on the **xhost** mechanism. As a caveat though, there are still some older (or not updated) X clients that do not understand Xauthority, and need the **xhost** mechanism turned on.

To look at the old method in more detail, consider the following list of commands:

```
% hostname
faraday
% xhost + emu
% remsh emu 'mymailer -display faraday:0' &
% xhost - emu
%
```

This illustrates how **xhost** (the host-based security method) was typically used. The **hostname** command was issued to show you the name of the machine I was running this from. The **xhost + emu** command told the local X display server to allow windows to be created from the host named emu. Next, a **remsh** command was issued that started the **mymailer** program, with the display redirected to the machine I was sitting at (faraday).

Finally the **xhost - emu** command was issued, which turned off access from emu. In this case, the security risk was only during the time between the two **xhost** commands, and only from attack by users on the host emu. If **remsh** was not enabled, an rlogin or telnet would have been used to start the program over on emu. In reality, many people used the **xhost +** command in a shell startup file, which allows access to the display by any user, on any machine, anytime. BAD IDEA.

A NEW GAME IN TOWN

The new Xauthority mechanism is user-based. This means that access to a display is granted to a particular user from any host, rather than any user from a particular host. CDE uses Xauthority by default. Here's how it works:

When a program (X client) is told to redirect its window to another display, a message is sent to that display asking for authorization to display. The item needed to gain access, is called a "magic cookie." This magic cookie was written to the user's $HOME/.Xauthority file when the X display server was started (at login time usually).

If the process running the display and the program are running as the same user in the same network, they should have the same home directory. Read that as MUST HAVE THE SAME HOME DIRECTORY for this to work. The X client process pulls the magic cookie from the file, and sends it to the display, which checks it against the same file, so they should match. If so, the program is allowed to display.

This means no **xhost** command was needed. But identical users IDs and a network accessible $HOME directory *are needed.* So, you could say that a networkwide password file and home directory are needed in CDE. That is true, though you can turn off Xauthority if you want. As an example of when you might need to deal with these magic cookies, consider this annoying habit of CDE:

```
% whoami
fredm
% su - root
Password:

!ROOT!$ sam &
Xlib: connection to "faraday:0.0" refused by server
Xlib: Client is not authorized to connect to Server
Error: Can't open display: faraday:0.0
```

IT'S A GOOD THING

In this case, we would need to get the cookie from fredm's $HOME/.Xauthority file, and put it in root's $HOME/.Xauthority file so that SAM could use the display as root. (Or, we could use **xhost +**.) For most users, Xauthority is a good thing. They can roam the servers in the network, and start programs that display back to the machine they are on, as long as the $HOME is available to the remote machine. In other words, the only command needed from the examples above is:

```
% remsh emu 'mymailer -display faraday:0' &
```

The rest was handled by Xauthority, assuming that emu can mount my $HOME directory, and my account was the same on that machine. Hmmm... So, what if I could not **remsh** to that machine, as I had a different account/password/home directory over on emu? Here is where the **xauth** command comes in handy. It is used to put information into another account's $HOME/.Xauthority file so that it is allowed to display. You could still issue an **xhost +** command, but that is insecure.

DEAL WITH IT

Here is the mechanism used to deal with different accounts being allowed to access a display (or in the case of not having a network-available $HOME directory). Remember that those who can log in as root typically do not have a network home directory, so dealing with Xauthority is needed. The command **xauth** is used to control the contents of the $HOME/.Xauthority file. It can be used interactively or from the command line. Here is how you can list your current .Xauthority file:

```
% xauth list
faraday.fce.com:0 MIT-MAGIC-COOKIE-1 34304a58335262542a54656f674c5169
faraday/unix:0 MIT-MAGIC-COOKIE-1 34304a58335263542a54656f674c5169
pavlov.fce.com:0 MIT-MAGIC-COOKIE-1 2f59597a4c34772132713136692f7947
pavlov/unix:0 MIT-MAGIC-COOKIE-1 2f59597a4c3477213271313669 2f7947
```

Here, we see that I have logged into two machines — faraday and pavlov. It stores cookies for both machines. The **/unix:0** entry is for local access; That way a process running on this machine does not have to go over the network to display locally. The pavlov cookie would be invalid if I have logged out of there already. And the next login would create a new entry. In order for another X client running on another host (or as another user on this host) to be able to display to faraday, it must be able to get the magic cookie listed above.

In the case of dissimilar users or host specific home directory's, we need to get this cookie to the other home directory's .Xauthority file. The **xauth** command that will spit out a cookie is **xauth extract filename display** or, in this example:

```
% xauth extract faraday-cookie faraday:0
```

This created a file called faraday-cookie in my home directory that contains the cookie for the display server currently running on faraday:0. I could then e-mail this file to another user, who would put it in their .Xauthority file, and be allowed to display to my display.

I also could take this cookie and put it in the .Xauthority file of the account on another host. The way to put this data into another .Xauthority file, once the file was moved to where it could be accessed by the other user account, is:

```
% xauth merge faraday-cookie
```

PLEASE PASS THE COOKIES

Now assuming the scenario that we started with, in which the account on emu is really mine, but we do not share a home directory for some reason (root account, different account uses, or we hate NFS), here is a convenient way to transfer the cookie:

```
% xauth extract - $DISPLAY | remsh emu \
'xauth merge - ;mymailer -display faraday:0' &
```

Of course, this assumes that we can **remsh** without providing a password. Dissecting the command, we used **xauth merge** to pull the cookie for **$DISPLAY**, and had it write the cookie to **-**, which means standard stream to be used as a file. We then piped this standard out (the cookie) to the **remsh emu** command. The \ was used because the command was getting kinda long, and it allows us to print it over two lines. The **remsh** command started the command string enclosed in quotes over on emu. We started two commands: **xauth merge -** took the cookie that was piped over, and merged it from standard in to the $HOME/.Xauthority file of this account. We then started the fictitious **mymailer** program, having it redirect the display back to faraday.

A quick way to send a cookie to another user that needs to display to your screen, would be:

```
% xauth extract - $DISPLAY | mail users-email-address
```

They could then copy the cookie into a file, and do something like this:

```
% xauth merge file-cookie-is-in
```

Using **xauth** keeps the network secure, and allows display only to a particular user; much safer than using **xhost**, which allows any old snot to display to your screen! Then again, in the examples here, we transferred the cookie around without encryption.

*— Fred was last seen trying to find a way to break into the Xauthority mechanism so he could display pictures of the model sailplanes he sells to every X Window display on the Internet. Or is that called the **extranet** now?*

Buy now while supplies last by sending your check and money orders (just kidding) to frederm@aol.com.

Charles Herbert

In The Grand Scheme Of IT At TBS

Network and systems management vendors would lead you to believe they will solve all your problems. But who are they kidding? As it turns out, the best solution often comes from many different places.

That was our challenge at Turner Broadcasting two years ago. Our initial requirements were simply to manage and monitor our growing worldwide WAN. But we had a grander plan for the future — true "enterprise management." We began by dividing enterprise management into four parts:

1. Network = the physical parts of the network
2. Systems = the OS level management
3. Applications = the specific application management tools
4. Service = the culmination of network, system and application management

With each step building on the one before it, we planned to select and implement "best of breed" software in each category as it became available. We chose five regional sites to implement HP OpenView Network Node Manager with Seagate NerveCenter to be the basis of our solution. These five sites included two sites in Atlanta, Ga., and one each in Los Angeles, Calif., London, United Kingdom and Hong Kong. Because our initial requirements were so closely tied to the network, it wasn't surprising our first software purchases addressed those needs.

HP OpenView provided us with a standard platform with good mapping and database functions. Seagate's NerveCenter gave us a flexible event-driven correlation engine. In other words, you could trigger alarms based on multiple actions. This correlation, while important for network devices, would be imperative for correlating events across our management model (network, systems and applications).

Almost immediately, we realized our "shareware" notification paging scripts were far from reliable. We selected a software/hardware solution from Telamon (Oakland, Calif.) called Telalert. This package gave us a reliable and flexible notification system that supports all forms of notification including paging, voicemail, cell phones, e-mail, and voice-generated phone messages, as well as an assortment of alarms and other goodies. Telalert proved its worth early on in the project because each location required a custom notification plan. Telalert worked flawlessly at each site. This first phase took a total of about three months.

Each site uses the system console as the master session and supports other users via HP Envizex and Entria X terminals. With the network layer of our solution in hand, it was time to address the system management function.

Location	Configuration	Number of Users
MASTER NODE		
CNN Center (Atlanta)	HP 9000/735, 2GB DISK, 400MB RAM	8
HP OpenView NNM and Seagate NerveCenter		
REGIONAL NODES		
Techwood (Atlanta)	HP 9000/715, 2GB DISK, 64MB RAM	1
Los Angeles	HP 9000/715, 2GB DISK, 128MB RAM	2
London	HP 9000/715, 2GB DISK, 64MB RAM	1
Hong Kong	HP 9000/715, 2GB DISK, 128MB RAM	2

Unfortunately, it was a futile attempt. We spent months looking at Tivoli, CA-Unicenter and HP AdminCenter and OperationsCenter.

MILES TO GO

Of course, all had their strengths and weaknesses. But we couldn't get a consensus from our customers of what they really wanted and were willing to fund and support. So we finally decided a different approach was in order. We selected a very good UNIX system monitoring SNMP agent from Empire Technologies (Atlanta, Ga.) for systems monitoring and combined it with cus-

tom-built Perl scripts to meet our bare minimum requirements and moved on.

Applications management was a new area for our staff. All of our combined experience had been in the network and systems management fields. The first application we wanted to monitor was e-mail. Like many large companies these days, e-mail had become a mission-critical application within Turner. And like other companies, e-mail at Turner was far from perfect. Our e-mail system is Lotus cc:Mail which consists of approximately 40 Windows NT and Novell servers that house the user post offices. From there, mail was routed by about 60 OS/2 machines throughout a hierarchical chain of hub and master post offices throughout the world. This system also supports a series of gateways that provide access to other internal and external systems and networks such as the Internet.

GETTING HEALTHY

By design, this system had many parts and many points of failure. We started by working very closely with the e-mail support group. They understood what made their system healthy and unhealthy. This was the key. We created a detailed list, and then prioritized it based on the probability of failure. Then, we started at the top of the list and worked our way down.

The e-mail routing system occupied the top of the list. When there was a failure, we always found out after the fact. Even worse, we usually found out there was a problem when a user called about an e-mail delivery problem. By that time, our entire e-mail system was thoroughly backed up and would take hours to catch up. So by solving this problem, we could not only reduce failures but improve our overall e-mail performance.

Our solution involved pulling status reports from all of our regional routing hubs to a centralized Windows NT management station. The Windows NT management station had an NFS mount to our master OpenView station in Atlanta. We then wrote a series of Perl scripts to interpret the data and determine the status of cc:Mail.

Now that we had raw application status, our next problem was presenting the data. Our first approach was to do it through HP OpenView. We tried it but there were some big problems. First, anybody that wanted to use the system would have to have X Windows capabilities — an expensive solution when only 20 people needed access to that information. Second, the HP OpenView interface was less than desirable for the cc:Mail administrators.

Our first approach was to do it through HP OpenView. We tried it but there were some big problems.

ENTER THE WEB...

It just so happened, while we were building our cc:Mail monitoring system, that we were also building a prototype for pulling network information from HP OpenView and Seagate NerveCenter and displaying it on the Web. Our prototype interface worked so well that when we incorporated the information from our cc:Mail monitoring, we had a winner. We called it Health Monitor. The Web solved our simultaneous user problem and gave us a great looking, flexible interface. Better yet, the users loved it. We have made many improvements since our original prototype system.

Our first Health Monitor server ran on a Sun SPARCserver 20 that was also Turner's first internal Web server. We realized within a few months that we needed our own Web server. So, we purchased an HP 9000/K200 with 128MB RAM running Netscape Communications server and made it our dedicated Health Monitor server. cc:Mail was our first application monitoring tool set. Since then, we have added other tools and improvements to our system.

Our latest system is a real-time Java applet-based Netscape Web server monitoring system. It gives real-time server performance and critical error information via the Web. This is now the premier monitoring toolset for the CNN Interactive Internet Web site and other Turner Web sites.

WHATEVER LIMITS US

The future is uncertain for us in many ways. Technically, we have been thinking about building our own SNMP agents to replace our custom built monitoring programs. We have selected SNMP agent development tools from SNMP Research International Inc. (Knoxville, Tenn.). We have a series of internally-developed APIs for Health Monitor to get information into its Web interfaces. Using SNMP agents instead of custom-developed scripts to collect data would make the interface into Health Monitor a better one. Also, instead of pumping all status information into our Web servers and then processing it, we could query via the SNMP agent for only the information we need.

Our future is also uncertain because of the Time Warner and Turner Broadcasting System merger. Our group, like others, is undergoing change as a result of the merger. At this point we are not sure what that change holds for us. In the mean time, we are staying the course and pursuing service management and keeping our Web efforts alive.

—Charles Herbert is IS manager at Turner Broadcasting.

Mark McFadden

$afe And $ound On The Net?

For some people, the thought of sending a credit card number over the Internet is more terrifying

than watching the X-Files in the dark. For many businesses and corporations, the idea of using the Web to link their products and services to potential consumers is a tempting goal. Yet, without an easy way to manage the exchange of payments for products many merchants remain skeptical about the value of going online.

Part of the problem is with the Internet standards. The big players in the Internet industry — Netscape, Sun and Microsoft — realize that they need to provide secure transaction capabilities. Unfortunately, each rushed a solution to market that was proprietary and failed to take into account traditional payment solutions such as credit cards. And without an open, industry-standard protocol for payment transactions, pundits' predictions of enormous growth in Internet commerce are going to be unfulfilled.

TO THEIR CREDIT

Unlike their colleagues in the networking arena, the giants of the financial industry saw the need (and the market) for a basic and secure protocol for credit card style transactions over the Internet. In February of 1996, VISA and MasterCard published a preliminary specification that provided a protocol for transaction authorization, authentication and capture. This protocol has become known as SET (Secure Electronic Transaction) and with the major players in the credit business behind it, it is likely to become a major force in the move to enable electronic transactions on the Internet.

SET defines roles for three parties in every Internet payment transaction: the buyer, the merchant and the bank that supports the transaction between them. For each player, there needs to be a secure way to authenticate their identity and encrypt the transactions they initiate. SET specifies the certification processes as well and the encryption and authentication methodology for financial transactions. The goal of SET is to produce an open and secure architecture for credit card-based payment.

Without an open, industry-standard protocol for payment transactions, predictions of enormous growth in Internet commerce will go unfulfilled.

GET READY, GET SET

SET provides a basic architecture for Internet commerce transactions while remaining consistent with the existing infrastructure for traditional credit card payments. The protocol is designed to be easily integrated into the existing global financial backbone rather than layering a new set of protocols and applications over existing transaction services.

A key component of any payment scheme is its cryptographic and authentication mechanisms. SET supports a variety of these, but each presents significant challenges for an implementer. Digital authentication, through "certificates," is required to ensure that the consumer and merchant are who they say they are. Current commercial "Certificate Authorities" are not yet established to provide the vast numbers of credit card holders with the certificates they would need to use SET.

In addition, SET-compliant code is not available in Web browsers today. For SET to become a force in Internet commerce, the process of obtaining, installing and configuring a SET-compliant add-on to popular browsers would need to be as simple as setting up the browser to handle Internet audio. A first step is to use existing protocols to replace the SET protocols on the client side. This allows some of the cryptographic and authentication overhead to be performed on SET-compliant servers rather than on the Web browser.

This would allow a customer to use a browser configured with the standard Secure Sockets Layer (SSL) to send an encrypted message including payment information to a SET-compliant server. The merchant's server would decrypt the SSL message and use SET to send a request for authorization to the supporting bank network. The bank would perform the authorization and use SET to respond to the merchant.

Finally, the merchant uses the approved request to encrypt a payment authorization and receipt message using SSL back to the purchaser's browser.

This approach allows existing browsers to participate in SET-based transactions and makes it possible for vendors to commit to a phased introduction to Internet payment protocols. HP is one of the vendors now partnered with established Internet-payment vendors to make SET a reality. With its strategy of providing security-enhanced solutions for the Internet, HP is working with VeriFone (Redwood City, Calif.) to develop the server-side tools needed for financial institutions and merchants.

The goal of SET is to produce an open and secure architecture for credit card-based payment.

The two companies are jointly working on HP-UX-based servers that implement SET using VeriFone's application software. For instance, vGate, a SET-enabled software solution that allows financial institutions to accept transactions from Internet-based merchants, would be offered on HP-UX servers. HP also intends to integrate VeriFone's merchant software in its Windows NT server platform.

HP already markets its HP 9000 servers to banks and has successfully focused on security issues on the Internet. The partnership with VeriFone finally integrates an open and secure payment protocol with existing HP Internet offerings. Perhaps this combination will make Internet financial transactions as common as government conspiracies, aliens and other paranormal beings appearing on the X-Files.

—*What are you conspiring to do on the Net? Let Mark in on the secret at* 73740.1101@compuserve.com.

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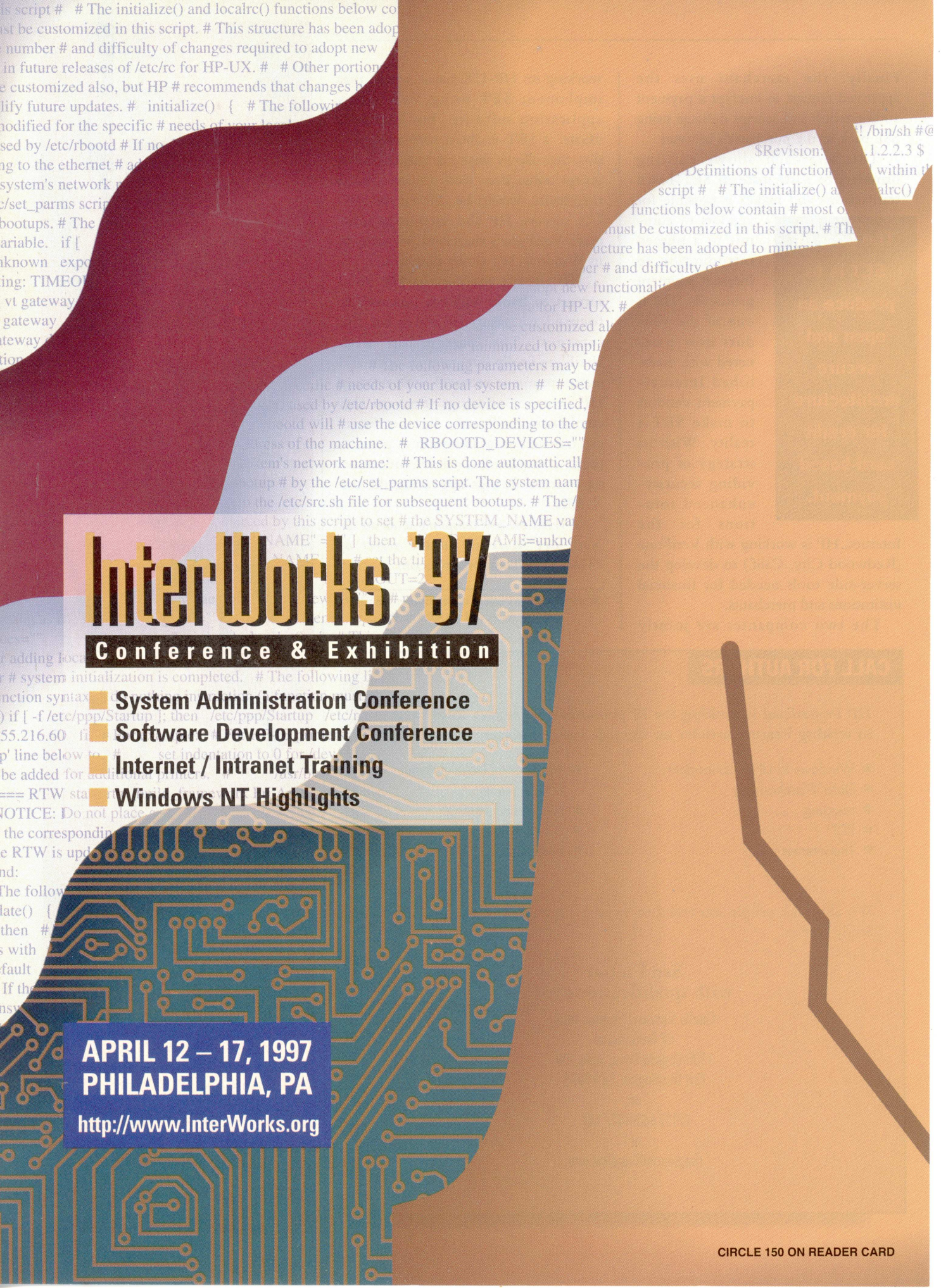

READER INFORMATION

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SOFTWARE

SCH Technologies Releases SystemWatch

SCH Technologies announced SystemWatch, a systems management tool. SystemWatch is usable "out-of-the-box" for systems management needs, such as managing disk space, memory, SWAP space, CPU utilization, host availability, database performance/availability, system/application processes and system logs. It also has event management which allows it to take intelligent corrective actions without administrator intervention.

Pricing begins at $695 including one year of maintenance. It supports HP, Digital Alpha, Sun and IBM platforms.

Contact SCH, 895 Central Ave., Cincinnati, OH 45202; (513)-579-0455; info@sch.com; www.sch.com.

Circle 400 on reader card

Design Data Systems Assists Comdisco

Design Data Systems Corp. announced that it will provide Comdisco Network Services with SQL*TIME Work Order Management, as well as its Oracle-based client-server Financials, Project Accounting and Order Entry suites.

SQL*TIME is proven across many industries and Work Order Management provides key benefits to vertical industries whose business activities assume everything is a project and need to manage the activities, processes and difficulty of selling both products and services on the same work order, while being fully integrated with financials and accounting.

Contact Design Data Systems Corp., Tampa Bay, FL 34643; (800) 655-6598; 70650.1112@compuserve.com; www.designdatasys.com.

Circle 399 on reader card

Micro Focus Supports Microsoft Transaction Server

Micro Focus announced it will support Microsoft Transaction Server in Micro Focus COBOL. The Microsoft Transaction Server, currently in beta test, is a component-based transaction processing system for Windows NT which allows COBOL programmers to build scalable servers using ActiveX technology.

Contact Micro Focus, 2465 E. Bayshore Rd., Palo Alto, CA 94303; (415) 856-4161; www.microfocus.com.

Circle 398 on reader card

IDT Unveils Net2Phone 5.02

IDT Corp. released the full-duplex beta version of Net2Phone, enabling Internet users to call any telephone worldwide from their multimedia PCs at lower costs than standard long distance calls. The full-duplex version allows users to conduct two-way simultaneous real-time conversations.

Net2Phone delivers a real-time, business quality, full-duplex, encrypted, communication system with point-to-point connectivity. The full-duplex of Net2Phone also introduces a unique set of features including 10 programmable speed-dial numbers and call duration which tracks amount of time spent on each call.

Contact IDT Corp., 294 State St., Hackensack, NJ 07601; (201) 928-1000; info@corp.idt.net; www.idt.net.

Circle 397 on reader card

BMC Software Enhances PATROL V3.1

BMC Software Inc. added usability enhancements and new features in Version 3.1 of the PATROL Management Suite. The new version features a logical application view of a managed environment, improved speed of problem diagnosis, greater management information access, and improved customization and deployment of PATROL.

PATROL Version 3.1 pricing begins at $6,000, depending on the number of consoles and managed objects.

Contact BMC Software Inc., 2101 CityWest Blvd., Houston, TX 77042; (800) 841-2031; www.bmc.com.

Circle 396 on reader card

Siemens Nixdorf Provides SmartAssist

Siemens Nixdorf announced their SmartAssist productivity tool which helps PC users automate their workflows. SmartAssist integrates standard PC software for Windows, Windows 95 and Windows NT, combining separate activities into agents which can be executed automatically. The software comes with a template library that allows jobs to be created by dragging and dropping from individual Windows applications.

It is fully network enabled and can operate on LANs such as Novell, Windows Network, Banyan and LAN Manager.

Contact Siemens Nixdorf USA, 200 Wheeler Rd., Burlington, MA 01803; (617) 273-0480; www.sni-usa.com.

Circle 395 on reader card

VirtuFlex Bundles NetCentric FaxStorm

VirtuFlex Software Corp. announced that it has bundled NetCentric's FaxStorm technology with VirtuFlex. Now developers can use only one command to integrate the capability of sending faxes from a Web site, replacing the need for complicated CGI scripts.

FaxStorm, an enterprise solution for delivering fax communications across the Internet, empowers Internet-connected users to send point-to-point and broadcast faxes to any fax machine worldwide.

VirtuFlex runs on standard UNIX workstations with 8MB RAM minimum (16MB recommended). Price is $995 and includes technical support and training.

Contact VirtuFlex Software Corp., 930 Massachusetts Ave., Cambridge, MA 02139; (617) 497-8006; comments@virtuflex.com; www.virtuflex.com.

Circle 394 on reader card

UniPress Software Announces FootPrints

UniPress Software Inc. announced the availability of FootPrints, a Web-based helpdesk system designed to record and track problems, solutions, bugs and change requests, and to make the information

available from the Internet.

The FootPrints Starter License includes the server software and three-user licenses and costs $1,995. Additional user licenses are $495 each. FootPrints requires a UNIX- or Windows NT-based Web server.

Contact UniPress Software, 2025 Lincoln Hwy., Ste. 209, Edison, NJ 08817; (800) 222-0550; info@unipress.com; www.unipress.com.

Circle 393 on reader card

MKS Brings Web Power To MKS Toolkit

Mortice Kern Systems Inc. (MKS) shipped MKS Toolkit 5.2 for Windows NT and Windows 95 with new features for tape conversion and Web development.

Version 5.2 adds Perl and an easy-to-use graphical interface for pax, along with a command line interface to Dynamic Data Exchange (DDE), the ability to create hard-links to files in Windows NT, and tools that interact with Web servers to retrieve, modify and update Web pages.

MKS Toolkit 5.2 for Windows NT and Windows 95 costs $399. Upgrades from any previous version cost $199.

Contact MKS, 185 Columbia St. W, Waterloo, ON N2L 5Z4; (800) 265-2797; sales@mks.com; www.mks.com.

Circle 392 on reader card

MDL Corp. Produces scsiCam

MDL Corp. introduced scsiCam, a SCSI-based videoconferencing system which allows up to seven heterogeneous workstations and Windows-based users to conference simultaneously over standard TCP/IP networks. In addition to features such as application sharing, whiteboard, videophone directory services, videophone call-waiting and call-holding, and video e-mail, scsiCam lets users record session to disk or magnetic tape.

Price is $1,495.

Contact MDL Corp., 14940 NE 19th St., Redmond, WA 98052; (800) 800-3766; sales@mdlcorp.com; www.mdlcorp.com/mdlcorp.

Circle 391 on reader card

Attachmate Delivers PC-to-HP Host Access

Attachmate Corp. announced KEA! 700/98 version 4.3, a PC-to-HP host access solution. It gives intuitive, managed access to corporate information on HP 3000 and HP 9000 systems from Windows, Windows 95 and Windows NT platforms.

Price is $395. Users of competitive software can trade up to KEA! 700/98 for $99 per license. Attachmate customers using EXTRA! Personal Client, can add KEA! 700/98 for $150 per license.

Contact Attachmate Corp., 3617 131st Ave. SE, Bellevue, WA 98006; (206) 644-4010; www.attachmate.com.

Circle 390 on reader card

Robelle Consulting Updates Qedit/UX

Robelle Consulting Ltd. announced a new version of Qedit for HP-UX. Qedit/UX is modeled on Robelle's Qedit for MPE, a full-screen editor. Qedit/UX version 4.5 offers a new Screen mode that makes all the full-screen editing features on Qedit available to users of VT terminals. Unlike Visual mode, Screen mode does not rely on the block-mode feature of HP terminals.

Contact Robelle Consulting Ltd., Unit 201, 15399-102A Ave., Surrey, BC V3R 7K1; (888) ROBELLE; info@robelle.com; www.robelle.com.

Circle 389 on reader card

New From HP

HP OpenView OmniBack II for Windows NT — HP announced HP OpenView OmniBack II for Microsoft Windows NT, an enterprise-level backup and restore solution. OmniBack II provides reliable data protection and easy data management from one central location or from distributed management stations across an enterprise. OmniBack II for Windows NT is designed for use in homogenous Windows NT networks and mixed Windows NT, NetWare and UNIX system environments.

It provides seamless integration with Microsoft BackOffice, performing online backup for Microsoft SQL Server and Exchange Server data. In addition, OmniBack II offers online backup for SAP R/3 data. OmniBack II for Windows NT allows a company to define usage and access policies, and accommodates the various needs of different departments. Price is $3,800.

HP 16500 Logic Analysis System — HP announced a special offer on the HP 16500 logic analysis system. The offer has two parts. When customers buy the HP E2488A system upgrade for their logic analyzers, they'll receive the HP 16505A prototype analyzer and the HP 16500 upgrade for a reduced price. In addition, buying the system upgrade entitles customers to exchange older models for new ones and be credited with $3,000 toward the purchase price of each new module. The offer is available through June 30, 1997.

The HP E2488A, which is the 16500A/B system upgrade and includes an HP 16505A prototype analyzer and the E2479A 16500C upgrade kit, costs $7,500. The HP E2479A, which is the HP 16500A/B to HP 16500C upgrade kit, costs $5,000. The HP 16505A prototype analyzer costs $4,995. And the HP 16500C logic analysis system mainframe costs $9,500.

ATM Verification Tool — HP announced enhancements to its parallel cell/traffic generator and analyzer system that are designed to speed up the verification process of ATM designs and eliminate the need for designers to use self-built test equipment.

The HP E4829B is a flexible verification tool designed for the new generation of ATM-switch architectures. The enhanced tool incorporates the ATM Forum-recommended UTOPIA (Universal Test and Operations PHY Interface) Level 2/MultiPHY (multiple physical interfaces) standard. The standards allows multiple interfaces to connect to one ATM layer/switch-fabric port, which enables concurrent engineering and allows simple interfacing between different design blocks. This, in turn, fosters effective design verification and debugging early in the design process.

A standalone setup for the HP E4829B starts at $61,000, and extensions to the HP E4200/E4210 BSTS begin at $31,000. To upgrade your existing HP parallel cell/traffic generator and analyzer system, an upgrade package costs $9,500 per module until March, and $12,500 thereafter.

HP JetDriect EX Plus Print Server — HP introduced an enhanced HP JetDirect EX Plus print server that delivers networking functionality for the HP DeskJet 870C color printer. It uses a new two-way communication technology that lets users monitor the status of the DeskJet 870C printer from their PCs instead of having to go to the printer. HP's graphical Tool Box software, which comes with the printer, makes installation and daily printer operation easy.

The two-way communication feature on the JetDirect EX Plus print server is available for the DeskJet 870C series printers under the following NOSes: Novell NetWare 2.x, 3.x and 4, and Windows 95 and Windows for Workgroups.

For more information, contact your local sales office or call (800) 533-1333.

Belmont Research Launches CrossGraphs

Belmont Research Inc. announced CrossGraphs, advanced data visualization and graphical reporting software. It automatically divides data into subsets and iteratively creates many graphs, one graph per subset, on one or many pages without programming. It also offers a variety of graph types to help visualize patterns and exceptions in multidimensional, time-ordered and spatial data.

It runs on HP-UX, Windows 3.1, Windows for Workgroups 3.11, Windows 95 and Windows NT, and SunOS or Solaris. Pricing starts at $795 for all Windows platforms, and $1,595 per user for systems running HP-UX, SunOS and Solaris. The Customization Option costs $1,995 per programmer on Windows, and $3,995 on HP-UX, SunOS and Solaris.

Contact Belmont Research, 84 Sherman St., Cambridge, MA 02140; (617) 868-6878; cginfo@belmont.com; www.belmont.com.

Circle 388 on reader card

Unibar BarCode 2000 Supports HP Printers

Unibar Inc. announced that its BarCode 2000 label printing software supports HP printers including LaserJet II, III, 4, 5 and 6 printer families. Special features include being able to start printing on any label on the page and printing up to 1,000 copies of each label.

BarCode 2000 is written in ANSI C, and runs on popular UNIX platforms. Additional printers supported include Datamaxx/Fargo, Zebra, Monarch Marking and C.Itoh. Cost is $1,099.

Contact Unibar Inc., 2731 S. Adams Rd., Ste. 102, Rochester Hills, MI 48309; (810) 299-5050; unibar@unibar.com; ic.net/~unibar.

Circle 385 on reader card

Advanced Software Technologies Releases GDDraw

Advanced Software Technologies Inc. released GDDraw, an entry-level design and modeling tool that features collaborative multiuser support.

GDDraw supports Intel-based PCs running Windows 95 and Windows NT, and UNIX workstations from HP, Sun, SGI and IBM. Pricing starts at $495 for either Windows version, and $995 for UNIX.

Contact Advanced Software Technologies, 7800 S. Elati St., Ste. 205, Littleton, CO 80120; (303) 730-7981; info@advancedsw.com; www.advancedsw.com.

Circle 384 on reader card

Gradient And HP Develop WebCrusader

Gradient Technologies Inc. joined with HP to provide WebCrusader security and functionality to HP Domain Enterprise Servers and HP-UX for deploying secure intranets. Gradient's WebCrusader SecureApp Engine and WebCrusader Security Authority will provide advanced security infrastructure for large-scale, mission-critical intranet/Internet applications using HP-UX and HP Praesidium/Security Service.

Contact Gradient Technologies Inc., 2 Mount Royal Ave., Marlborough, MA 01752; (508) 624-9600; info@gradient.com; www.gradient.com.

Circle 383 on reader card

HARDWARE

ACHC Announces FlashLink

American Computer Hardware Corporation (ACHC) announced FlashLink, a compact communications device that eliminates preprinted report forms. The form, and its report data, are simultaneously printed on the client's existing laser printer, normally at 4 to 24 ppm.

If reports come in while the printer is busy, FlashLink's 256K memory stores up to 150 report pages and prints them next, at the printer's maximum speed. FlashLink works with inkjets or any printer with a parallel port and HP PCL5 support. The unit is entirely plug and play, requires no software, and is independent of computer platforms and operating systems.

FlashLink is $495 per unit in small lots.

Contact American Computer Hardware Corp., 2205 S. Wright St., Santa Ana, CA 92705; (800) 447-1237; sales@achc.com; www.achc.com.

Circle 382 on reader card

Liebert Introduces 500kVA Static UPS

Liebert Corp. announced an addition to its transistorized 600T UPS line — the 500kVA model. The 500kVA units are line-rectified products and as with the other 600T UPS models, the inverter sections are designed with Insulated-Gate Bipolar Transistors (IGBTs) instead of Silicon Control Rectifiers (SCRs). The Liebert 600T design makes optimum use of advanced-design IGBTs, which have lower switching losses, lower saturation losses, higher gain and better reliability.

Prices start at $98,500.

Contact Liebert Corp., 1050 Dearborn Dr., P.O. Box 29186, Columbus, OH 43226; (800) 877-9222; www.liebert.com.

Circle 381 on reader card

Socket Announces Connectivity Products

Socket Communications Inc. announced a family of connectivity products compatible with the latest generation of handheld personal computers (HPCs) designed to run Microsoft's Windows CE operating system platform. Price for the Serial I/O Card is $169, and the PageCard is $399. The PageCard is also available from GTE bundled with paging service starting at $29.95 per month.

Contact Socket Communications, 6500 Kaiser Dr., Fremont, CA 94555; (800) 552-3300; info@socketcom.com; www.socketcom.com.

Circle 380 on reader card

Source Technologies Offers MICR Line

Source Technologies announced a new line of MICR printers. The ExpressPrint 6 features multiple paper handling capacity, 600 dpi print quality and as low as 14 seconds first page to print. The unit will support both parallel and serial interfaces. Twinax and coax connections are optional, using a Source Technologies proprietary interface. Ethernet and token ring networks also are supported. Price is $1,495.

Also announced was the ExpressPrint 8 to serve the needs of higher volume users. The ExpressPrint 8 offers larger paper capacity and an 8 ppm print speed suited to higher demand environments. Price is $1,995.

Contact Source Technologies Inc., 628 Griffith Rd., Charlotte, NC 28217; (704) 522-8500; sales@source.com; www.sourcetech.com.

Circle 379 on reader card

U.S. Robotics Releases x2

U.S. Robotics announced x2, a modem technology that provides Internet and online connections at nearly twice the speed currently available over standard telephone lines. With x2, downloading data increases from 28.8- or 33.6Kbps to 56Kbps.

x2 will be a software download for the following U.S. Robotics products: Total Control Enterprise Network Hub remote access server, MP I-modem integrated modem pool, NETServer I-modem remote access server, Courier I-modem integrated analog modem/ISDN terminal adapter and Courier V. Everything analog modem. Additionally, all U.S. Robotics Sportster products in the channel are upgradeable to x2.

Contact U.S. Robotics, 6600 Silicca Way, Gilroy, CA 95020; (800) 881-7256; sales@usr.com; www.usr.com.

Circle 378 on reader card

CompactFlash Available For HP OmniGo 120

SanDisk Corp. announced that HP will market HP-labeled CompactFlash (CF) storage cards with the HP OmniGo 120 Organizer Plus. SanDisk's CF is a small, removable, matchbook-sized storage card.

The HP OmniGo 120 features holographic technology that illuminates the screen for a brighter display, built-in Pocket Quicken for managing personal finances, 1MB RAM and a Type II PC Card slot. Price is $399. HP is offering the 2MB CompactFlash card and CF adapter for $199. The adapter allows the CF card to operate in any existing PCMCIA PC Card ATA slot.

Contact SanDisk Corp., 140 Caspian Court, Sunnyvale, CA 94089; (408) 542-0500; www.sandisk.com.

Circle 377 on reader card

CLARiiON Introduces Series 300 Disk Arrays

CLARiiON extended it's family of disk arrays with the CLARiiON Series 3000, which provide up to 30 3.5-inch drives per enclosure and up to 90 drives in a rack-mount cabinet. The Series 3000 delivers capacity for 3TB of storage in a footprint of under 20 square feet. It also includes: a redundant subsystem architecture to protect against component failure; online maintenance for easy and fast "hot-plugging" of system components; and an advanced system design which includes mirrored write cache to increase performance while maintaining data integrity.

Prices start at $21,600.

Contact CLARiiON, Coslin Drive, Southboro, MA 01772; (508) 480-7350; info@clariion.com; www.clariion.com.

Circle 376 on reader card

Camintonn Z-RAM Adds To HP Workstation Memory

Camintonn Z-RAM announced a 256MB Memory Kit which uses new 64-bit DRAM technology, for HP B- J- and C-class workstations. Price for the HP 256MB kit of two is $8,429.

Also announced was a 2GB memory upgrade for the Digital AlphaServer 8200/8400, VAX 7000 memory, and a 1GB upgrade (kit of eight) for Sun Ultra 1 Enterprise workstations.

Contact Camintonn Z-RAM, 22 Morgan, Irvine, CA 92618; (714) 454-1500; caliotta@z-ram.com.

Circle 375 on reader card

PRODUCTshowcase

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CAREERopportunities

Corporate Climate Survey

The only constant in industry is change. Whether it's downsizing, restructuring or acquisition, it's a subject that affects all of us professionally and personally. So, we're interested in how you feel.

1. Do you consider yourself staff or management?

❑ Staff ❑ Management

2. If your company has undergone a structural change, when did it occur?

❑ Occurring now
❑ Within past 6 months
❑ Within past year
❑ 1 to 3 years ago

3. How would you describe the reorganization?

❑ Downsize in personnel
❑ Acquisition
❑ Change of market or primary product/service
❑ Merger
❑ Company was acquired
❑ Growth without acquisition

4. What did the reorganization mean to your position and your department?

❑ Increased workload ❑ Decreased workload
❑ Wage increase ❑ Wage decrease
❑ Positions created ❑ Positions eliminated
❑ Budget increase ❑ Budget decrease
❑ More autonomy ❑ Less autonomy
❑ Other (please specify): _____

_____

_____

_____

5. Which phrase best describes your feelings during the reorganization?

❑ No affect
❑ Afraid I would get laid off
❑ Eager for new duties
❑ Mad at the way it was handled
❑ Other (please specify)_____

_____

6. How did these feelings impact your job performance?

❑ Positively ❑ Negatively ❑ No affect

7. How did the reorganization affect employee loyalty to the company?

❑ Increased ❑ Decreased ❑ No affect

8. Do you believe conditions at your site are unique or do they represent business in general?

❑ Unique ❑ Business in general

9. Do you think there is a "negative" corporate loyalty shift going on in American business?

❑ Yes ❑ No

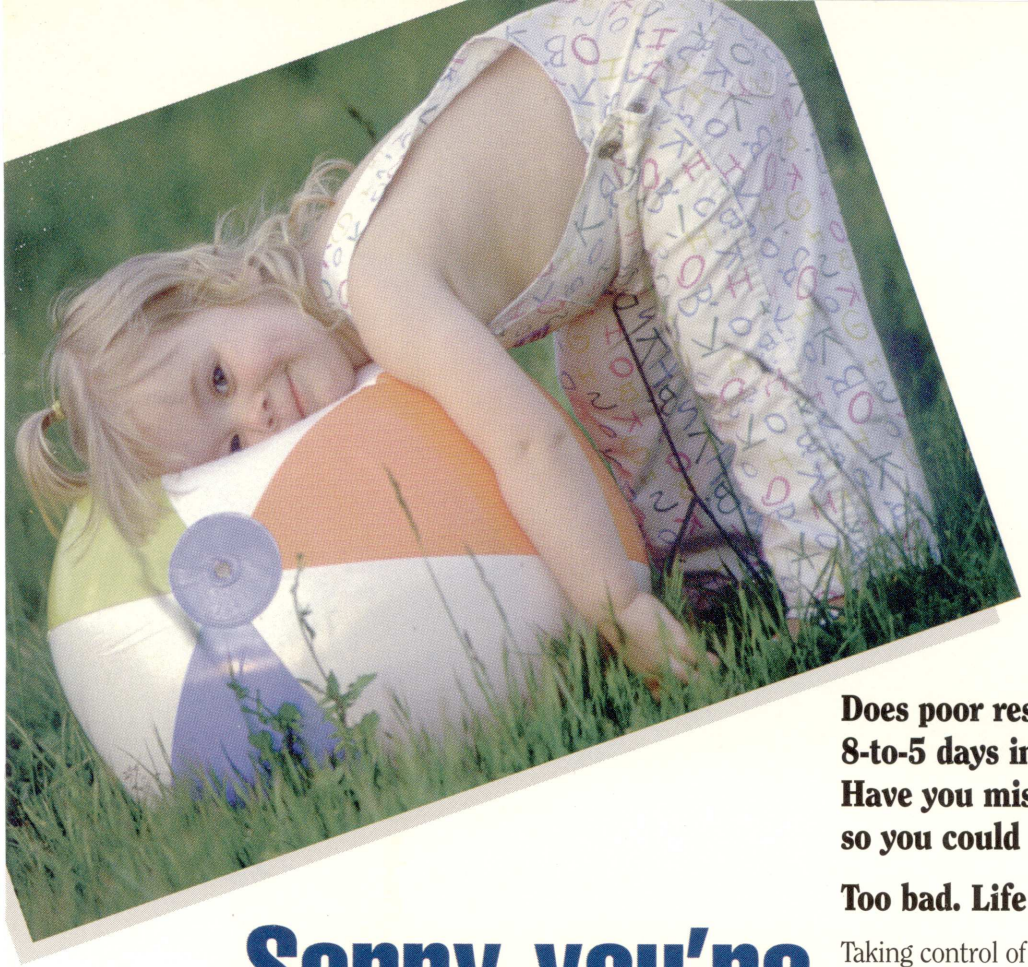
10. Which statement best describes today's corporate climate? (Check one)

❑ We fear change
❑ Change is good
❑ Do what needs to be done today, worry about tomorrow, tomorrow
❑ We have a clear vision

Fax completed form to: (215) 643-4827

Or mail to: HP Professional, 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034

E-mail any responses or additional comments to: simpsoncm@cardinal.com



Sorry you're working late?

So is she.

Does poor response time turn your 8-to-5 days into 24-by-7 weeks? Have you missed out on weekend picnics so you could reload your disk drives?

Too bad. Life doesn't have to be that way.

Taking control of your operating environment is no easy task. But with the help of **DiskSpace Manager from Bradmark**, the job gets a whole lot easier. With this powerful tool at your fingertips, you'll soon be spending more time wrestling with the kids and less time juggling your disk space.

DiskSpace Manager is a multi-purpose tool that allows you to manage your **HP 3000** disk environment easily and efficiently, gaining substantial new space without the expense of additional hardware. It runs online, without operator intervention, and uses HP's Transaction Manager (XM) to protect data integrity.

Using features like truncation, defragmentation, spreading and combining of files, and ManageFile, you'll soon be managing you disk environment effortlessly, and be assured of top I/O performance.

No headaches. No worries. No juggling.
No weekend interruptions.

Get out of your office and back into your life. Get DiskSpace Manager.

For a free demo, call 1/800/294-1251 ext. 501.

DISKSPACE MANAGER

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The Data Management Company

CIRCLE 108 ON READER CARD

If you only connect to one host, count your blessings. If not, count on WRQ.

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Maher Nejad, Systems Manager, Computer Associates International

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- *Intuitive operations, advanced text and graphics emulation, and powerful programming tools*

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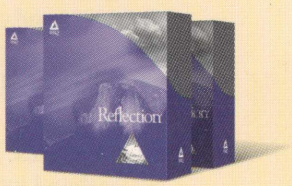

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